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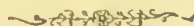
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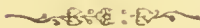
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P R E F A C E .

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The Executive Committee in presenting to members the Transactions of the first Intercolonial Congress of Australasia, regret the unavoidable delay in the preparation of this volume.

While it does not embody such full reports of discussions in some of the sections as might be desired, it places on record the majority of the papers read.

In a few cases want of space has compelled the curtailment of valuable contributions.

Recognising the difficulties incidental to the inception and conduct for the first time of a medical gathering from the widely separated, and sparsely populated colonies of Australasia, it is hoped, that members will criticise leniently the shortcomings inseparable from first efforts.

The Executive Committee cannot conclude their duties without expressing their deep sense of appreciation of the services rendered to the Congress by their Honorary Secretary (Dr. Poulton), to whose laborious and unremitting efforts is largely due whatever success may have been achieved.

By order of the Executive Committee

(Signed.)

JOS. C. VERCO, President.

Adelaide, S.A., March 1888.

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ERRATUM.

Page 203. Line three from bottom, add "about and after the menopause."

ERRATA.

- Page 119. Line 2, for "Volekmann" read Volkmann.
- Page 119. Last note, for "Volekmann" read Volkmann.
- Page 147. Line 21, for "Lungenbeck's" read Lungenbuch's.
- Page 164. Line 11, for "Votalini" read Voltolini.
- Page 165. Line 9 from bottom, for "Froutmann" read Trautmann.
- Page 182. Line 5 from bottom, for "Raleagliati" read Rabagliati.
- Page 182. Line 5 from bottom, for "Bedford" read Bradford.
- Page 185. Line 20, for "Benj." read Berry.
- Page 189. Line 13, for "Benjamin" read Berry.
- Page 224. Last line, for "Schroder" read "Schroder.



INTERCOLONIAL MEDICAL CONGRESS.

FIRST SESSION.

TUESDAY, AUGUST 30TH, 1887.

CIVIC RECEPTION OF MEMBERS.

HIS WORSHIP THE MAYOR OF ADELAIDE (E. T. Smith, Esq., M.P.,) received the members at the Town Hall, and entertained them, together with several leading citizens, at luncheon in the Banqueting-Room.

INAUGURAL MEETING.

The inaugural meeting of the Congress was held in the Councillors' Room, Adelaide Town Hall. In addition to the members of the Congress there were also present a number of visitors, the room being well filled. His Excellency the Governor arrived at 3 o'clock, and was received and escorted to his seat by the General Committee.

The PRESIDENT (Dr. Verec), in opening the proceedings, said—In order that we may know what has already been done in reference to the Interecolonial Medical Congress, as Chairman of the Executive Committee I will call upon Dr. Poulton, the Honorary Secretary, to read the report from the Committee.

Dr. POULTON (Adelaide), read the following report:—

REPORT OF COMMITTEE.

“May it please your Excellency, Mr. President, and Gentlemen—This Interecolonial Medical Congress of Australasia is the outcome of a suggestion made by the Council of the South Australian Branch of the British Medical Association at the annual meeting held in June, 1886. The Council suggested that a Medical Congress might well take place during the Jubilee of Her Majesty's reign, at a time when the Province of South Australia would be celebrating the completion of the first fifty years of its history, and during the term of the International Exhibition in Adelaide. The members of the Branch heartily concurred in the suggestion, and being the only organised

Medical Society in South Australia, forthwith appointed a Committee to co-operate with the Council in formulating the scheme of such a Congress, and in inviting the co-operation of the profession throughout the Australasian colonies. Funds were placed at the disposal of the Joint Committee to defray preliminary expenses. The Joint Provisional Committee consisted of Messrs. Cleland, Cludeuing, Corbin, Hayward, and Drs. Gardner, Poulton, Stirling, Davies Thomas, Verco, and Watson. Early in September a preliminary announcement was posted to all accredited members of the profession throughout the colonies whose addresses could be ascertained, inviting their co-operation. A special appeal was made to medical practitioners in South Australia not members of the British Medical Association. Special communications were addressed to the Presidents and Chairmen of the Medical Societies of Australasia. Notice of the proposed Congress was sent to the medical press of Australia and of India, and to the chief organs of the profession in other parts of the world. Through the good offices of the Committee of the International Exhibition representations were made to the Agent-General and to Sir Samuel Davenport with a view to obtaining an adequate display of scientific appliances at the Exhibition. Numerous promises of support were received from representative members of the profession in the various colonies, and the Council of the University of Adelaide generously granted the use of their halls. Reporting to the South Australian Branch of the British Medical Association in October, the Joint Committee was instructed to continue its labours and to place the matter fully in the hands of the profession. A circular was accordingly issued in November inviting all legally qualified practitioners to become members of the Congress and to assist in carrying it to a successful issue. The invitation met with a hearty and general response, and the first meeting of subscribers was held in Adelaide on December 11, 1886. It was then determined that the Congress should be held on the lines suggested by the Provisional Committee. Dr. J. C. Verco was elected President, and an Executive Committee was appointed, consisting of twenty members, with power to add to their number. The Governors of all the Australian colonies and of New Zealand accorded their patronage to the Congress. Sir Anthony Musgrave, G.C.M.G., a former Governor of this province and now Governor of Queensland, expressed his special gratification in being associated with a movement so well calculated to benefit the profession and the public throughout Australia. Sir Charles Mitchell, of Fiji, has written regretting that the exigencies of the public service would probably prevent the desired attendance of some of his leading

medical officers. The Presidents of all the Medical Societies of Australasia have become Vice-Presidents of the Congress. Special delegates are present from the New Zealand Medical Association; from the Universities of Sydney and Melbourne; and from the Medical Societies of Sydney, Melbourne, Brisbane, Ballarat, and Sandhurst. The Executive Committee conducting the business of the Congress reported progress on July 14 to a meeting of the members. A small business Committee, appointed by the Executive, has met frequently since January. A Reception Committee, under the presidency of Dr. Stirling, has been actively engaged in providing for the entertainment of visitors. The number of members on the list to-day is 155, and includes practitioners from New South Wales, Victoria, New Zealand, Queensland, South Australia, the Northern Territory, and Fiji. The work of the Congress will be conducted in the four main sections—Medicine, Surgery, Gynæcology, and State medicine—under the presidency of Dr. Williams, Mr. Fitzgerald, Mr. Foreman, and Dr. Whittell respectively. The Committee in submitting this report of its work would express the hope that this Congress may result in such substantial benefit to the profession throughout these colonies as to warrant the convening of a second session at no far distant date."

Dr. J. DAVIES THOMAS (Adelaide), moved that the report be adopted, and

Dr. J. JAMIESON (Melbourne), in seconding the motion, said—Speaking as a member of the medical profession in Victoria, I must say that we do not grudge to the profession in South Australia the honour and privilege of initiating what we hope and believe will be a series of these Congresses. At the same time I would venture to say, speaking for the members of the profession in Victoria, that if it should happen that the honour of having the second of these meetings should fall to us we should be inclined to deprecate holding it too soon, because it must be clear to all that it will take a good deal of time and a great deal of thought before we could expect to hold a Congress in Melbourne as successful as we are likely to have in Adelaide. We should like the next Congress not to be inferior to that now to be held. I have great pleasure in seconding the motion.

The motion was carried unanimously.

The PRESIDENT—Inasmuch as the report has been adopted and all appointments and arrangements made and ratified, we are now constituted as a Congress, and that being so, and as His Excellency has kindly become our patron, it is now my pleasant duty to ask him at this juncture to declare our Congress open.

THE GOVERNOR'S OPENING SPEECH.

HIS EXCELLENCY, who was received with cheers, said:—Mr. President and Gentlemen—It is with great pleasure that I once more find myself taking part in a meeting of an intercolonial character, the third or fourth, I think, that may be said to be directly due to the Jubileo celebrations and to that federal spirit the growth of which we have noticed with so much satisfaction. First came the opening of the Exhibition, the great event of the year, followed by that quick succession of visitors which has done so much to draw the colonies together. This was succeeded by the Intercolonial Chess Congress and the Intercolonial Rifle Matches, both of them events of much interest and importance in their particular ways; and to-day we welcome from the other colonies, and from distant parts of our own, the members of a noble, learned profession, whose conference in the fair city of Adelaide will mark an important step in the development of federal unity, and should prove of far-reaching benefit to the public. Medical Conferences have been held before now in older parts of the world, as witness the meetings of the International Medical Congress, of which I understand seven or eight have been held in London and on the Continent of Europe. But this, I believe, is the first held in Australia of an intercolonial character, and I am sure I echo the sentiments of all present when I express the hope that it may be in every sense of the word a success. But a few years ago such a meeting of medical gentlemen engaged in the active business of their profession would have been difficult, if not impossible. To-day it is not only possible but easy, thanks to the rapid improvement that has of late taken place in the means of communication between the colonies, and probably one question to be considered before you separate will be as to the possibility of arranging for similar Conferences in the future, thus securing for this Association now inaugurated a permanent intercolonial character. The scope and object of this Conference will be better explained to you by others, but even to the unprofessional mind it must be clear that great good may be expected from such a meeting as this. Longfellow has said that

Joy, temperance, and repose
Slam the door on the doctor's nose.

Temperance—in other words, moderation, that golden rule of life—it is open to all of us to practise. Joy and repose are not so easily commanded, especially by those who are engaged in the battle of public life; and the hurry and toil of existence will tell on us here in time, as they have told for generations on older and more densely peopled communities. We know that even in the delightful and

health-giving climate of Australia we cannot escape those ailments to which the flesh is heir, and when the leading medical men from the various colonies meet and, as I assume they will, confer together upon such questions as the sanitary condition of our cities, the prevention as well as the cure of disease, the influence of our climate for good or evil on complaints which are formidable elsewhere, and other kindred questions, it is clear that valuable results may be anticipated, and not at all surprising that the public should feel much interest in the Conference. I understand that we are indebted for the inauguration of this movement to the South Australian Branch of the British Medical Association, which, acting on a suggestion from Dr. Poulton, took steps for carrying this project into effect. That the exertions of the promoters of the Conference have been so far successful is shown by the pleasing circumstance that we welcome to-day some forty or fifty gentlemen from the neighbouring colonies, together with some hundred from South Australia, all of whom have done us the honour of cordially responding to the invitations which have been addressed to them to be present. On behalf of the people of South Australia I beg to extend to our visitors a cordial welcome. That we are all glad to see them is evident from the printed programme of proceedings, recording as it does the desire of our leading colonists to do them honour. The only fear, indeed, is that in congratulating themselves, as they will undoubtedly be able to do, on the accomplishment of much valuable work, they may also have to say with the Archbishop of York in Henry IV., "We are all diseased, and with our surfeiting and wanton hours have brought ourselves into a burning fever." Mr. President and gentlemen, I will now no longer detain you. I will only say in conclusion that I feel it an honour to be connected with this Conference as one of its patrons, and hope that the members, one and all, may carry away agreeable recollections of their visit to South Australia.

INAUGURAL ADDRESS.

The PRESIDENT said—Your Excellency, your Honor, your Worship, medical gentlemen, and ladies and gentlemen: My first pleasure to-day is to thank the Intercolonial Medical Congress for the honour of my election as President.

The history of our meeting has been told by our General Secretary (Dr. Poulton), so that no words of mine are needed to lay this matter before you.

It may be easily believed that when this Congress—the first of its kind in the Australian Colonies—was proposed, some misgivings were entertained as to its success; but the distinguished patronage of His

Excellency, so readily granted, and the patronage of all the Governors of the Australian Colonies, secured by his aid, banished all fear of failure. And when the various Medical Societies and the leading professional men in the sister colonies gave early and hearty support to the movement, we had but to proceed with such arrangement of details that the greatest good to the greatest number might accrue.

Such a large gathering as this of busy men—some from great distances—testifies that our Congress is neither premature in time, puerile in its intentions, nor petty in its anticipated results; and we do not feel the slightest diffidence in assuming at this early period the mantle of the prophet, and predicting to those anticipations a large measure of fulfilment. As my audience to-day consists largely of the Congress itself, it can scarcely be necessary for me to justify its existence, or show its advantages. Our roll of members to the number of 155, is in itself a sufficient vindication, and furnishes 155 witnesses in evidence of its presumed advantages. We need only direct our eyes to the old world, where similar gatherings have become a recognised institution, and see what vast proportions they have already assumed, to form some estimate of their real or supposed value. The seventh session of the International Medical Congress, held in London in 1881, had a register of nearly 3,200 members, congregated from every country on the continent of Europe, from North and South America, from the Cape of Good Hope, from the eastern coast of Asia, and to the number of a score from Australia and Tasmania. The distance travelled by those Australians and Tasmanians might be used as a strong argument in favour of the International Congress, but is doubly strong on the side of an Interecolonial Meeting. The long voyage to Europe, even though now contracted within the space of a month, is an absolute barrier to any but the most limited participation by us in an International Congress, for how few, even for such a pleasure, could arrange a three months' absence from duty. But the thousands of miles which separate us from the old world, and preclude a personal intercourse with our medical brethren in the International Congress, create a distinct need for general meetings amongst ourselves. Our continent is not only the antipodes of Europe, but to some extent its antithesis; it is not only isolated, as much almost as distance can isolate, but it is in many of its essential features a different sort of world. We live, we study, we practise amid circumstances very unlike those of Europe, and special to ourselves, and which therefore demand a special adaptation on our part. And while we could never afford to dispense with the vast stores of medical knowledge which come to us across the seas, or disregard the latest results of that delicate and

elaborate research which the very nature of things has hitherto prohibited among ourselves, we can as ill afford to neglect the special recognition of our own surroundings, or the application of that borrowed knowledge, whether extensive or intensive, to our peculiar colonial conditions. And that this special recognition may be full, this adaptation perfect, we need conference. Without doubt many problems can be and must be solved far more satisfactorily in Europe than here. To enter into competition is to court defeat, for neither the wealth of material, the special apparatus, nor the otherwise disengaged labour are to be found among us. But on the other hand it is beyond question that much ought not and cannot be done for us; we have a special field for interesting research, special experiences to embrace, special difficulties to overcome, and to help and fit one another in this work we need conference. Let me briefly point out some of these circumstances, which are worthy of our notice, and which demand our mutual attention.

(1) Coming, as our enterprising forefathers did, a three or four months' voyage over a disinfecting sea, they left many of the terrible scourges of humanity behind. The plagues of the olden time, and of the new, are largely only names and phantoms among us. Hydrophobia, the sweating sickness, relapsing fever, typhus, the cholera, have never from their shrivelled lips breathed pestilence and death over our fair land. Now and again a foul form is seen prowling at our doors; the people are anxiously uneasy at the threatening danger. But hitherto the monster has been strangled upon the threshold. I ask, is not the heritage we enjoy in our freedom from these plagues a special boon? Does it not involve, in common prudence, a special duty, a special vigilance, and since our communication with the old world has become more rapid—and hence the liability to the importation of infection increased, and our intercommunication is more extensive and more speedy, and hence the distribution of infection greatly facilitated—is there not special need for concerted intercolonial action, for discussion amongst ourselves of such subjects as federal quarantine? And how is this emphasised by the virulence and wildfire-spread which characterise infectious diseases in tropical and subtropical regions, and still more by the fact that it is in the domain of preventive medicine that the grandest victories of late years have been gained, and if I can read the times aright, it is in the department of preventive State medicine that the largest, if not the most brilliant triumphs will yet be won.

(2) Then, again, is it not generally recognised that we have diseases in our land—some, unfortunately, too common—which

in Europe are comparative rarities? It is scarcely necessary to mention them in this company. There is hydatid disease. Do we not meet with it at every turn? Have we not to keep it in mind in our diagnosis of every tumour, external or internal, every collection of fluid, every central nervous derangement, every obstinate cough, every hæmoptysis, however trivial? Who has not been surprised by the unexpected apparition of these parasites? Our experience of this disease is probably a hundred times more extensive than that of our European brethren. Here, then, is a special subject. To be honest with our patient we must study it thoroughly. To the truth-seeker here is ample opportunity. We should be teachers to the antipodes in this department rather than learners, and we are proud that there are some among us who are attaining this position. Whence comes pterygium? In England it is a visitor from the tropics. In Australia it has its home. Here it is born, and grows to grand proportions. What are its antecedents? How is it begotten? What is its mode of life? Thousands of instances are to hand. Watch them! Learn and teach the truth! Go up North, into certain districts, at particular seasons, and you will find a complaint called "Barcoo." What is it? A British physician never saw a case. Many a one has never even heard of or read the name. Most know nothing about it. Why? Because we have not yet taken advantage of our opportunities to properly investigate and describe. Here is a complaint whose natural history is unknown, or, at least, unpublished. What an interesting field of observation has been opened up in connection with filaria disease. The story of its elucidation, with which the names of Bancroft (of Brisbane) and Manson (of Amoy) are inseparably associated, reads more like fiction than fact, tracing to the insignificant mosquito a number of serious tropical diseases, and grouping them, despite their diverse forms, into one natural order. Is it credible that the mosquito is the only insect agent in our various obscure complaints, or that the Amoy mosquito is the only offender of its kind? Who will be the Bancroft of other filariæ? the Manson of the next mosquito malady?

(3) But, again, what an area for survey is opened up in the modification of diseases which are common to the old world and the new. That the types are altered who will deny? That with an identity of disease there should not of necessity be wide variations who can imagine? Consider the difference between the climate of England and that of any of our Australian colonies, from Queensland in the tropics of the north to Victoria in the south—the humidity of Britain and the aridity of Central Australia. Contrast

the millions of population there, crowded within a few thousand square miles, with our three millions of people scattered over as many millions of miles. Compare the social state, with its destitution there, where poverty means disease and death, with the comparative plenty here, where poverty, even when present, means but little more than inconvenience. Does anyone ask for evidence that these causes *do* work? I have measured 300 South Australian immigrants from the old world. They stand 5 ft. 7·13 in., and weigh 146·58 lbs. I have contrasted them with 250 South Australians born in this colony. They average 5 ft. 8·21 in., and weigh 146·42 lbs. Our native population are therefore about an inch taller than their forefathers, and within the fraction of a pound the same weight. What is the significance of these facts? That our southern climate, our social circumstances, our mode of life, are altering the physical constitution of the healthy man, of the growing child, and giving him a taller and more slender form. Whether this be a development or a degeneration I will not say; but it is this—an evidence of the modifying influences which are at work upon our material economy either for good or for ill. And those same surroundings which, in a single generation, can add one inch to our stature must probably operate in altering the incidence, the prevalence, the manifestation of disease. Our South Australian statistics, for example, covering a period of fourteen years, show that phthisis is less than one-half as common here as in England. Is it exactly similar to that of Great Britain? What is the comparative predisposition of our native population to this complaint? What may we expect in the next generation? What are those influences which are so steadily effecting the extermination of our aboriginal races? Is our rheumatic fever the facsimile of what we studied in the hospitals of London, Edinburgh, and Dublin? Do we get the pericardial friction rubs with the same frequency or the same intensity, and if not why not?

(4) Again, we live in a new country. In the old there is scarcely a locality, high or low, whose meteorology has not been thoroughly worked up and criticised in reference to its suitability for a health resort; scarcely a spring the chemical composition of which has not been examined with a view to its use as a mineral water; scarcely a plant of any note whose physiological properties have not been investigated and its medicinal virtues tested, not merely by the wise women of the villages, but by expert pharmacologists of the schools. Here there is a bewildering profusion of novelty and diversity courting our curiosity and inviting our labour. We cannot send our invalids to Madeira or the South of France or Davos Platz. But have we not between the snowclad mountains of New Zealand or New South

Wales and the scorching tablelands of the interior, variety enough to meet all our requirements, were we possessed of information sufficiently definite to warrant advice and action? We cannot utilise the thermal springs of the Continent of Europe for hydrotherapeutic purposes. We can scarcely afford for our patients the natural mineral waters that have to be bottled 10,000 miles away for any but temporary use. But have we no thermal springs, no mineral waters of our own? This is the very complaint from which our country suffers. The streams which gush from our artesian bores, are they not thermal enough? The springs which rise spontaneously in the North, are they not mineral enough? They are so impregnated with saline ingredients, so brackish that they destroy rather than nourish vegetation; the very cattle cannot drink them; but yet our technical knowledge of these springs is so meagre, more especially of those most accessible, that we are unable to employ them, and humanity lives in misery or dies prematurely, whilst relief and life are wasting in the sands. We read accounts, we hear the experience—half amusing and half pitiful—of the physical troubles endured by men who are compelled to drink these nauseous waters, how they are worked by them *ad deliquum*; how they break out in boils and blisters; how they swell until they can barely crawl into hospital. It requires but little reflection to perceive in these very troubles the curative treatment for various forms of disease. Could we send our sufferers into those regions, and induce these consequences in a measured form, we should have a means of relief. But we must know more that is definite and decided before we can act with assurance, and therefore act at all. We have an indigenous flora, largely peculiar to Australia. What use has been made of it medicinally? Some, but not enough. The derivatives of eucalyptus, the redgum, and a few others. Here and there a worker records some experiments or some experiences. But whole forests are yet unexplored ready to yield us—shall we prophesy?—better antiperiodics than quinine, better anæsthetics than cocaine, better stimulants for heart and cord than digitalis or strychnine. These poisonous herbs of which we read now and again as having proved so deleterious to stock, do not their baneful properties evidence a physiological action upon the animal economy which we only require to understand and to control by fixed principles and regulated doses so as to transform the curse of the cattle into a blessing to mankind? From these noxious plants we may derive our substitutes or antidotes for belladonna, convallaria, or opium, &c. Let us believe these worthless weeds were given to amplify our *materia medica*.

(5) Look, again, at the different conditions under which our

work is performed. First, in the city. Here we have no special class of pure consultants such as are found in London, but every man is more or less a general practitioner, and, on the other hand, each one is in turn called in to consult, and that in all departments of medicine and surgery. Further, even our largest cities are not so large but every man's practice overlaps every other man's, and all come into a kind of competition. Moreover, there is a freedom of intercourse, a circulation of news, a canvass and criticism of medical work and professional men such as is an impossibility in the larger and less democratic cities of Great Britain. Do not these special circumstances entail special responsibilities in relation to our patients, to each other, and to all codes of medical ethics? It becomes quite a question whether it is wise or right to bind ourselves absolutely by those regulations which may be needful and best in a country where the surroundings are different, and whether on some points we should not be even more stringent. Notice, too, our peculiar position as regards a legal standing. In some of the colonies there is practically no Medical Act. This of necessity gives us a relation to the State and to unqualified practice very dissimilar to that in which a practitioner in Great Britain stands, and this altered relation must free us from some of the conventional usages of medical society, and at the same time imposes on us extra obligations, and places us in positions of peculiar difficulty. In discussing also legal recognition by our respective Legislatures we should regard the special characters of our colonial Governments, and still more the special exigencies of colonial life—not only in the large centres, but in distant parts as well—that we may neither hamper a free profession nor a free people by a rigid and unsuitable law, nor tantalise a learned and certificated profession, and blind a public which has often but little will and less material for discrimination by an Act which is practically lawless. Look, again, at the isolated country practitioner, hundreds of miles from the capital, in his thinly-populated district. For months together he is entirely cut off from the society of his professional brethren, without a chance of interchange of ideas or the stimulus even of competition. Skilled assistance is unobtainable. He must do with his own unaided hand what is resolved by his own unsupported judgment. Such a state of things is almost unknown in the old country. The remedies and the appliances, too, at his command are often of the simplest nature and most limited supply, and with these he must do his best and improvise according to his need. Picture a medical man, on a newly-discovered goldfield, whither there have rushed within the course of two or three weeks thousands of men, living, as they have

never lived before, in flimsy calico tents; their work unusual, laborious, and exposed; their diet often insufficient, inferior, unvaried, and badly prepared; their drinking water brackish, and contaminated with decomposing organic matter; the very air polluted by unsavoury and insanitary surroundings. Picture the practitioner working according to the methods of a London Hospital. No, he must grasp the situation, and adapt himself to it; do what can be done with the means at his disposal, meagre though they be; and accommodate his treatment to the circumstances, however unfavourable and unusual. In greater or less degree the same applies to us all: for instance, the excessive heat of our summer, continued for many days together, not only relaxes the fibre of the healthy, but often kills outright the very young, the old, and the feeble. Have we not to tax our ingenuity and our resources to the utmost to obviate its fatal tendencies in the case of delicate infants and of those suffering from pyrexia, whose probabilities of life are seriously reduced by the heat of the houses and the air? And so in many other particulars our surroundings are unlike those of medical men in England, and if we are wise our manner and our methods will vary in an equal ratio. Just as the special characters of our colonial land business, brought as a wise and natural consequence the Real Property Act in place of the cumbrous methods of land transfer still in force in England; so should the exigencies of colonial life result in wise and simple adaptations in the domain of medicine, and whether it be the disposal of our sewage or the disposal of our dead—not to follow blindly the sentiments of other society or the example of others, but learn what had best be done by us and do it—taking all the experience of others, but not failing to combine it with our own.

To resume then. There is reason why Australian professional men should meet in Congress—that they may make common property what facts peculiar to Australia have been observed in disease, what methods employed have proved most appropriate in their hands, what new remedies Nature has provided at our doors, what suggestions relating to medical ethics or legal status arise out of our colonial life, and that an opportunity may be afforded those far away to contribute their unique or exceptional experiences for the general interest, and to reap the pleasure and profit of that social and professional intercourse which is so rarely theirs.

Now, almost the same facts which we have mentioned as arguments in favour of conference could be adduced with equal force in support of an intercolonial medical journal, in which our facts, theories, and proposals might all be made common property, be discussed in

measured words, and be preserved for future reference. And while we could not abandon our *Lancet* and *British Medical Journal* and other British weeklies, which are our post-graduate educators, and keep us abreast of the times, we ought to have some organ of our own which has the confidence and support of all the colonies, and in which shall be perpetuated whatever is worthy in connection with Australian medicine. And might we not as a Congress discuss such an enterprise?

Now, I do not imagine that our Congress will accomplish during this week all I have indicated as lying within our province. Even the best of us requires to be educated up to the possibilities, and the best methods, of such gatherings. To know we have fairly and unitedly begun will be a satisfaction. Especially will this be the case if, as I hope, it shall be decided before we conclude our business to call the Congress together again, and to regard this gathering in Adelaide as its first session only. This will be for you to determine. One suggestion only I will make if the decision be favourable. Let the sessions be neither so frequent as to be impracticable, nor so infrequent as to lose their interest.

Nor do I presume our arrangements will be found perfection. The Committee has laboured under the disadvantage of having to inaugurate, and has therefore been compelled to take to itself certain powers, because they could not be conferred. It has had to draw up a tentative programme for the simple reason that it had no previous experience as a guide. This disadvantage will not be the lot of future executives, and must be our apology for any dislocation of appointments which may occur.

His Excellency has done us the honour to open our Congress, for which our heartiest thanks are justly due.

We shall find abundant opportunity for honest work in the four sections which have been arranged. Let each one be devoted to it with a threefold motive—the improvement of ourselves, the benefit of our fellows, and the advance of truth.

Dr. STIRLING (Adelaide)—I am sure that I am only fulfilling the wish of everyone here when I express to your Excellency our deep sense of pleasure and gratification at your presence amongst us to-day, both in your capacity as Her Majesty's representative and as patron of this Medical Congress. In many ways you have shown the kindly interest you have taken in its proceedings, and I am certain if this Congress is to achieve success, as there is every prospect of its doing, it will be in no small measure due to the kind assistance we have received from those whose work lies outside that of the profession to which we belong. It is because we all recognise your own efforts in this direction that it is such a plea-

sure and a duty on the part of the Congress to express to you our hearty thanks for your presence here this afternoon.

Dr. WILKINSON (Sydney) seconded the motion, and the vote of thanks was carried with acclamation.

HIS EXCELLENCY, in responding, said—Gentlemen, I thank you very much for the cordial way in which you responded to the vote of thanks to me, and the mover and seconder for the graceful terms in which they have put it to you. I have already stated that I feel it a great honour to have been invited here to open the Congress. I can only say that if the remainder of the proceedings are marked by the same practical ability and interest as have characterised your President's address to-day, we may well expect great and good results from this important Congress. Again, gentlemen, I thank you for so kindly acknowledging my small services on this occasion.

Dr. J. O. CLOSS (Invercargill) moved—"That a special meeting of this Congress be held on Thursday at 2 p.m. in the Library of the University to consider the advisability of holding another Medical Congress at some future date in one of the Australian colonies, and other matters of interest to the medical profession."

The Hon. J. M. CREED, M.L.C. (Sydney)—As a visitor to the Congress, and President of the Medical Association of New South Wales, I have great pleasure in seconding the resolution.

The motion was carried unanimously.

Dr. VERCO—I now declare the Congress stands adjourned till to-morrow afternoon at 3 o'clock.

The proceedings then terminated.

SECOND DAY, WEDNESDAY, AUGUST 31.

GENERAL MEETING.

The general meeting was held of 3 o'clock in the Library of the University of Adelaide. The President (Dr. Verco) in the chair.

The PRESIDENT, in opening the meeting, said—Gentlemen, to-day we have to set to work in earnest. Yesterday, it might be said, we were in broadcloth; to-day we are in fustian. To-day we begin our general meetings and go into the different sections to discuss the different subjects. It is with sincere regret that I have to announce that owing to ill-health the Chairman of the Section of Medicine (Dr. John Williams, of Melbourne) is unable to be present to read his address on Medicine, which is set down for this afternoon. Professor Allen has, however, undertaken his duty with regard to reading the address, and before proceeding with the business we had better elect a successor to Dr. Williams, as Chairman of the Section of Medicine.

Dr. J. DAVIES THOMAS (Adelaide)—I move that Dr. Dixon, Lec-

turer in Materia Medica at the University of Sydney, be Chairman of the department of medicine.

Dr. J. JAMIESON (Melbourne) seconded the motion.

The motion was carried unanimously.

Professor ALLEN (Melbourne) said—I, with all members of the Congress, deeply regret that Dr. Williams is prevented through serious illness from attending the Conference. Before I left Melbourne he handed me the copy of his address, which I promised to read should he be unable to come over. Within the last day or two I regret to say that I have received a telegram stating that owing to the state of his health he was unable to bear the journey from Melbourne to Adelaide.

Professor Allen then read the address on Medicine, and after some remarks thereon by the President, the Congress divided for sectional work.

THIRD DAY, THURSDAY, SEPTEMBER 1.

SPECIAL GENERAL MEETING.

At 2 o'clock a special meeting was held at the University in accordance with the motion carried at the Inaugural Meeting to consider the advisability of holding another Medical Congress at some future date in one of the Australian colonies. The President in the chair.

Professor ALLEN (Melbourne University) said—Mr. President and Gentlemen—It appears to me that there are three questions to be discussed by this special meeting. Firstly—The time and place of the next session of this Congress. Secondly—The best method of federating the different Medical Societies and Associations throughout Australasia; and Thirdly—The possibility of securing the inclusive *Australasian Medical Journal*, which shall represent the profession throughout all these colonies. With regard to the first of these, I am strongly of opinion that it would be a mistake to make the sessions of this Congress annual. The sessions of the body if such a course were adopted, would lose in dignity, in weight, and in interest. The papers which were contributed would be less mature and more suitable for the monthly meetings of a local Medical Society than for the more grave and serious deliberation of an Intercolonial Medical Congress. The attendance, too, would soon become meagre, and the enthusiasm now so manifest would rapidly wane. The labour imposed on the conductors of the Congress would be very severe, and I have grave doubts whether the members of the literary Committee of this Congress yet grasp the burden of the work which will shortly devolve upon them in collecting the work of this Congress in some form or other, and I venture to prophesy that by the time they have

finished the work they will be prepared to strenuously oppose the too frequent repetition of these Congresses, and say that another session should not be held next year. If a sufficient interval be allowed to elapse for recovery from the present Congress, and to garner new material for our next session, I venture to say it will be a great success. We shall have the experience of this session to help us; the wise arrangements of our brothers in South Australia which can be copied, and perhaps improved upon in one or two points. Interest in the sessions of the Congress will be maintained, and we can rely upon it that excellent work will be done. To me it seems that three years hence would be a fitting time to hold the next meeting, and if the Congress should determine to meet three years hence in Melbourne, I can vouch for the profession in Victoria, the University of Melbourne, and the learned Societies of the colony that a most hearty welcome will be given to the members of the Congress. I am sure that such a welcome as I have spoken will be given, and will be some small return for the magnificent hospitality which we from the other colonies are now experiencing in Adelaide. The only question to my mind which arises as to the time when we should sit is the fact that an International Exhibition is to be held in Melbourne next year, and it may be asked whether that fact is not sufficient to interfere with the theory of holding triennial meetings of this Congress. For myself, I think it is not, and if we once draw ourselves away from regular meetings, whether triennial or otherwise, it will be a difficult point to decide what occasions would warrant such a procedure in the future. It would be a mistake to go to Melbourne next year. If, however, the Congress determine to have a session during the Melbourne Exhibition, although I think it would not be a wise step, I am sure that everything we can do to make the visit pleasant and profitable will be done to the utmost of our ability. Secondly, with regard to the establishment of an Australasian Medical Society and an inclusive Australasian medical journal, we must walk warily. We must not forget that there are Societies and journals now in existence which have histories in the past, and which now do useful work. In Victoria, for example, the Medical Society of which I am Honorary Secretary has existed continuously since 1855, and the *Australian Medical Journal*, the organ of that Society, has been almost as long in existence. We must not hastily interfere with present organizations without sufficient security that our new and more ambitious projects will have equal power of continuous life. Far be it from me to deprecate or discourage the federal spirit to all medical research and work throughout these colonies, but it would be wise to remit these questions to the medical organizations

and journals throughout the colonies, so that by careful deliberation and consultation when we do federato we may federato without imperilling the good which we have already obtained. I propose that the next session of the Medical Congress be held in Melbourne three years after the present session.

Dr. CLOSS (Invercargill, New Zealand)—I have much pleasure in seconding the motion. I am sure that the members of the Congress are agreed that when we do meet again, Melbourne is the most suitable city in Australasia in which to hold the Congress, and I am sure that many members are also agreed that to hold another Medical Congress a year hence would be far too soon. Members of the profession will not have time to accumulate sufficient facts on a logical basis to bring before such a Congress. I therefore, have much pleasure in seconding the motion so ably moved by Professor Allen that the next Intercolonial Medical Congress be held in Melbourne in 1890.

Mr. CURTIS (Port Adelaide)—I propose as an amendment that the Congress meet in Melbourne next year. That will be the year of the Exhibition, and will be a most suitable time for such a gathering. After next year we can meet every three years.

Dr. WILKINSON, M.L.A. (Sydney)—I will second the amendment. I concur with Professor Allen in thinking that it would be a mistake to make these meetings too frequent, and therefore, I feel that the theory of triennial meetings is a sound one. But at the same time I feel that sound reasons can be advanced for making an exception in the case of next year. In the first place the Melbourne Exhibition is being undertaken by the Victorians in such a spirit of enterprise that I am sure it will be an unqualified success. The effect of it will be to draw to Melbourne many people from different parts of the world, and it is not beyond reason that to expect among the visitors to Melbourne next year there may be medical men from different parts, even from Great Britain and Europe. It is no unusual thing for leading members of the profession in London to take trips to different parts of the world extending over two or three months for a change. Mr. Heath made such a trip to the Cape of Good Hope a short time ago, and many physicians in London have spoken to me of the possibility of their making a visit to these colonies. I think it is not only possible but very probable that some medical men not only in England but also in America and other countries will come to the Exhibition, and why should we not then hold a Congress? In considering matters of this sort it is well to leave out of the question altogether, and to as much as possible forget what particular colony we belong to. Medical men should not be limited in their sympathies by any geographical limitation. The objects of scientific men demand for science an intelligent observance all over the world. In fixing the city in which the next Medical Congress is to take place out of South Australia, it must be admitted that New South Wales, as the oldest colony in Australia, should have the right of considering whether Sydney should not be the place for the Congress to meet. If it is now decided to hold the next Intercolonial Congress in Melbourne, I think I may speak for the medical profes-

sion in Sydney and in Brisbane in saying that if the next Intercolonial Conference be held in Melbourne next year, no objection will be raised in any of the other colonies. Of course Professor Allen knows as well as anyone the work which these Congresses involve, and perhaps he is a little anxious to put off to a more distant date the work which will devolve upon him if we have the next Medical Congress in Melbourne. I would suggest that it would be better to hold the next Congress in Melbourne while the Exhibition is open, and I feel sure if we decide to do so the meeting will be a success, and will shine not only with its own glory, but will derive a certain lustre from the Congress in which we are now participating. I therefore beg to second the amendment, and I hope to be allowed to extend my most hearty thanks to the members of the profession in South Australia who have inaugurated and have made it such a pronounced success.

Dr. J. DAVIES THOMAS (Adelaide)—There are a few remarks I would wish to make with regard to the proposed meeting next year in Melbourne. In the first instance we should ascertain what the feeling of our intended hosts upon the subject is. It is a question for the Victorian members of the Congress to decide when it will suit them to receive us, and we cannot dictate to our next hosts what time it will be convenient for them. I think the feeling is decidedly expressed by them that next year would be an inconveniently early time for the Congress to be held in Melbourne.

Dr. Closs (Invercargill)—I do not think sufficient reasons have been advanced to show that we should hold a Conference next year. The only reason given is that the Melbourne Exhibition will be open, and that consequently a few scientists from other parts of the world may be present. That is not a sufficient reason to make it a success. It may bring numbers, but we want more than numbers. We want proper scientific work, and if we have only a year in which to accumulate facts, we shall not have sufficient papers to be brought forward. I do not think the reasons advanced are sufficient to make the next Intercolonial Congress, if held in a year's time, a complete success.

Professor ALLEN (Melbourne)—With regard to the feeling of Victorian delegates on this Congress, we shall be delighted to receive members of the next session any time they please, to meet them and extend to them to the utmost limits of our power the same kind of hospitality which has been so agreeable to visitors during this session. But we feel that time is needed for gathering matter and experience before the Congress meets again. We trust that at the next session we shall have a more representative and larger number of medical men from different parts of the world than it has been possible to get together on this occasion. We hope that we may be able to induce several leading members of the profession in Great Britain to come over. I trust this hope may be realised, but if it is to be, we must give time to communicate with them, and let them make their necessary arrangements. We do not wish to jump the claim of precedence which New South Wales has for holding the next session in that colony. We recognise the claims of New

South Wales, but it does not matter whether it takes place in New South Wales or Victoria. My objections to the proposal to meet next year are that it does not give us sufficient time to get together the weight of material and complete such arrangements as we would desire, and in the second place that it would introduce an irregularity in our procedure which would be most undesirable.

The Hon. J. M. CREED, M.L.C. (of Sydney), speaking on behalf of the profession in New South Wales—I think undoubtedly New South Wales would have liked to take precedence in this matter, but the members of the Congress from Victoria having moved in it, we should be discourteous were we to attempt to monopolise the gratification and pleasure of having such proceedings in New South Wales. The only reason which would make it advisable that the Congress should hold its next session at so close a period as next year is that it would be held during the Melbourne Exhibition. It is a matter more nearly connected with Victoria, and if the profession in Melbourne find that they can hold the second session of this Congress successfully next year, I think they can override a special resolution of this meeting, and three years after, the Congress can meet again in Sydney.

Mr. CURTIS (Port Adelaide) said—I should not have proposed the amendment had I not thought that it would suit Victorians to have a session next year; but, as Mr. Creed says, it would be ill-advised to start any opposition. I only thought that next year being Exhibition year, it might be advisable to hold the Congress in Melbourne then, or else certainly New South Wales being the oldest colony, the next triennial meeting should be held in Sydney.

Dr. WILKINSON (Sydney)—I feel certain that this Exhibition next year will be a grand success, and will by itself attract all the leading practitioners from the other colonies to Melbourne at that particular time. Speaking for the medical profession of New South Wales and Brisbane, I am at liberty, I think, to say that we will be better represented at the next Congress. Unfortunately New South Wales is not very well represented at this Congress—not nearly so well as we would have liked—and Brisbane is represented to a worse degree. The influence of a Congress like this is very much increased if the leading men from the different colonies can be brought together. I consider the absence of Dr. Bancroft, of Queensland, from this Congress is a great loss, and I feel that next year we shall have a better opportunity of getting a thoroughly representative meeting of members of the profession from all the colonies, and I would suggest to Professor Allen that for this reason it might be advisable to hold a meeting of this Congress next year instead of three years hence. It is an opportunity which will not occur again, and to my mind an opportunity which should not be lost.

Dr. DIXON (Sydney)—I would certainly join as one from Sydney in saying that I should only be too delighted to assist at a Congress in Melbourne. As to the time when it should be held, I think it would be well to leave that to the profession in Victoria to decide.

Twelve months must be a short time to make the necessary provisions for such a Congress. I was at the last International Congress at Copenhagen, and saw the great amount of preparatory work which was necessary. If it took the old countries three years to prepare, I do not think it can be done here in one year, and I do not think three years too little. If they think they can do it in twelve months, then all I say is, God speed them.

Dr. E. C. STIRLING (Adelaide)—I would suggest, Mr. President, that these two questions should be considered separately. There is the question as to whether these meetings shall be annual or triennial, and that as to where the next meeting shall be held. I propose that we deal with these matters separately. If it is decided that the Congress shall be held in Melbourne—and I think New South Wales appears willing to concede that point—it will be then open to the members of the profession in Victoria, who will be our hosts, to express their collective opinion if it appears to them that next year is the proper year in which to hold the Congress. I therefore suggest that the motion be first put that the next Intercolonial Congress be held in Melbourne.

Professor ALLEN (Victoria)—I am perfectly willing that my motion should be split in two. It may be put that the Congress meet in 1890, or such earlier period as the medical societies of Victoria shall determine. I will move, as Dr. Stirling suggested—"That the next Congress be held in Melbourne."

This motion was carried unanimously, and Professor ALLEN then moved—"That the next Congress be held in Melbourne in 1890, or at such time as the medical societies of Victoria shall determine."

This motion was also carried.

Dr. E. C. STIRLING (Adelaide) said—As a necessary corollary we should elect a President before we as a Congress separate. We are not merely representatives at a South Australian, but at an Intercolonial Medical Congress, and it will be for us as a body to elect our next President. If that is not done before the Congress separates there will be no properly-constituted body to make the election, and it seems to me some such steps should be taken now.

The PRESIDENT (Dr. Verco)—At the International Congress held in England the President was elected at the first meeting of the new session. We might either nominate a President or delegate the nomination to the Medical Societies of Victoria, and have him elected at the first meeting of the session.

Dr. GARDNER (Adelaide)—I beg to propose—"That after the address on State medicine is delivered a meeting be called to elect the President-elect of the forthcoming Congress in Melbourne."

Dr. E. C. STIRLING (Adelaide)—I second the motion with great pleasure.

The motion was carried, and the special meeting closed.

THIRD DAY—THURSDAY, SEPTEMBER 1.

GENERAL MEETING.

The PRESIDENT (Dr. Verco) in the chair.

There was a large attendance of members.

The PRESIDENT read a telegram from Dr. Williams, expressing regret that he was unable from illness to attend the Congress and occupy the Chair of Medicine.

The PRESIDENT called upon Mr. T. N. Fitzgerald to deliver his address as Chairman of the section of Surgery.

At the close of the address the PRESIDENT made some remarks appreciative of Mr. Fitzgerald's address, and the Congress divided into sections.

FOURTH DAY—FRIDAY, SEPTEMBER 2.

GENERAL MEETING.

The PRESIDENT (Dr. Verco) in the chair.

The PRESIDENT called upon Mr. J. Foreman, the Chairman in the Section of Gynæcology, to deliver his address.

Mr. FOREMAN then read his address.

The PRESIDENT—Lack of time must be my excuse to-day for not saying much about the paper to which we have just listened with such great interest. The vast range which has been covered by the paper we have heard and the definite expressions of opinion we have had from Mr. Foreman, who has made this subject his special study, and the hopefulness which he expresses for the future of this branch of medical science, are something we can only admire. I cannot say more at present, because I have to call upon Dr. Whittell to read his paper upon the subject of State Medicine.

Dr. WHITTELL then read his address.

The PRESIDENT (Dr. Verco)—This closes the series of addresses which have to be delivered before the General Congress, and the address is one which will commend itself to us all. I think a vote of thanks should be passed to the gentlemen who have delivered these addresses.

Dr. GARDNER (Adelaide)—I have much pleasure in moving a vote of thanks to the Chairmen of the Sections, who at considerable inconvenience and loss of time have prepared these able addresses which have given us so much pleasure and information. Each one of the addresses has shown special excellence in the department of medical science with which it dealt. I have much pleasure in proposing a vote of thanks to the Chairmen of Sections.

The vote was accorded unanimously.

The Hon. J. M. CREED, M.L.C. (Sydney)—Mr. President, I have been asked by many members of the Congress to perform a duty which gives me very great pleasure. As the time at our disposal is so short, perhaps the less I say the better. I have to propose as President of the next session of this Congress a gentleman not merely of colonial but of world-wide reputation, who is so well known to all of us as to need no eulogy from me. I am sure I am only expressing the feeling of this meeting when I rise to propose Mr. T. N. Fitzgerald, of Melbourne, as President-elect of the next session of the Intercolonial Medical Congress.

Dr. GARDNER (Adelaide)—I have much pleasure in seconding the motion. I have known Mr. Fitzgerald personally for seventeen years, and I know of no man in a better position with the profession and the public, and more suited to be President of the Congress. Therefore I have great pleasure in seconding Mr. Creed's motion.

The motion was carried with acclamation.

Mr. FITZGERALD (Melbourne)—Mr. President and gentlemen, I can assure you that I feel profoundly sensible of the great honour you have conferred on me. Although an old hospital surgeon of over a quarter of a century's experience, and one who takes a great interest in my profession, I feel a certain amount of distrust in myself in undertaking the Presidentship of the Congress, and I can assure you, Mr. President, I am not made much more comfortable by my reminiscences of your oration at the inaugural meeting, because I feel that I cannot hope to compete with that. Yet I shall do all I can, and shall undertake the duty with great pleasure. I shall trust to my friends and confrères to help me, and I shall depend very much upon them to assist me. When I was at home I met a great many of the most eminent physicians of Europe, and after the Congress at Copenhagen I asked several of them if they would come out to Australia should we hold a Congress here. Many said that they could not spare the time, but two gentlemen whom I consider among the first members of the profession told me that they could. I asked them if they thought they could induce any others to come. One of them said he believed we could get several prominent physicians out here if we gave them sufficient notice of our intention to hold a Congress. Mr. President and gentlemen, I thank you sincerely for the honour you have done me.

Dr. JAMIESON (Melbourne)—It is necessary now, sir, for this Congress to appoint a Publication Committee, and I think you will agree that that Committee must have considerable powers, because it is possible that some of the papers read before the Congress may not be worth printing, at any rate in full. It is just possible that some of us may have a better opinion of our views and experience than others may have of us. Some of the papers which were offered to the Congress, I think, need hardly be printed, and it is necessary that we should give the fullest powers to the Publication Committee, for it would be only on formally delegated powers that the Committee would be inclined to take any responsibility of interfering with the matter placed before the Congress. The Committee ought to be strong, not necessarily in numbers, but in men, and I think there

will be no difficulty in getting these from among the members of the profession in Adelaide. I move that the Publication Committee consist of the President (Dr. Verco), Dr. Stirling, Professor Watson, Dr. Gardner, Dr. Thomas, and Mr. Cleland. Those who know these gentlemen will have little hesitation in agreeing that they will make a model committee, and the result of their work can but give satisfaction to all.

The Hon. J. M. CREED, M.L.C. (Sydney)—I have been asked by several members of the Congress to second the motion. I am sure the gentlemen whose names are mentioned have the confidence of all, and that they will be able to exercise the judgment required in collating the work of this Congress. I have great pleasure in seconding the motion.

Dr. E. C. STIRLING (Adelaide)—While I am quite sure, sir, that we shall be willing to do the best we can in the matter, I am certain also that our labours will be assisted, and the result of our deliberations made more satisfactory, if the names of two gentlemen from New South Wales and Victoria be added. I understand that this has been suggested, and that the names of the Hon. J. M. Creed and Dr. Jamieson have been mentioned in that connection, but that they have seen difficulties in the way. Still I take it that it would be a great satisfaction to those who constitute the Committee if the names of these gentlemen are added, not necessarily to do the whole work, but to give us the benefit of their opinion in those cases in which it may be necessary to exercise a discriminating judgment. I trust neither of the gentlemen will refuse. We, in South Australia, would not trouble them more than necessary, but I know it will be a source of great satisfaction to have them at our backs.

The Hon. J. M. CREED (Sydney)—I shall have very great pleasure in assisting as much as I can.

Dr. J. DAVIES THOMAS—I shall second the motion of Dr. Stirling for the addition to the Committee of the names of Hon. J. M. Creed and Dr. Jamieson.

The motion, with the addition, was carried unanimously, and the proceedings terminated.

On the evening of Tuesday, August 30th, His Honor Chief-Justice Way, Chancellor of the University, received the members of the Congress at a *conversazione*, given by him in the University Halls.

The building, illuminated throughout by the electric light, was crowded by a large and brilliant assemblage, including His Excellency Sir W. C. F. Robinson. Among His Honor's guests there were many residents of the neighbouring colonies.

The music was under the direction of Professor Ives. Professors Bragg and Rennie gave short lectures, profusely illustrated by experiments. Physiological and other apparatus was shown by Dr. E. C. Stirling, Dr. J. M. Symons, and others.

On Wednesday evening a large number of the members were received by Mr. and Mrs. Barr-Smith, at Torrens Park, Mitcham.

On Thursday morning a large party of members was driven to the Sewage Farm, and inspected the system, under the guidance of the officers of the Hydraulic Department.

Dr. WHITTELL, President of the Board of Health, read a descriptive paper before the visit was made. (Printed at the end of the articles in State Medicine).

On Thursday evening, September 1st, members were received by His Excellency the Governor at Government House.

On Friday morning, Mr. J. H. Symon, Q.C., invited a large party of members and their friends to visit his extensive vineyards and plantations at Magill.

On Saturday, a number of members were entertained by Sir Thomas Elder, G.C.M.G., at luncheon, at his residence, Birksgate, Glen Osmond, and they, with others, afterwards attended an afternoon dramatic performance at Torrens Park, by invitation of Mr. Barr-Smith.

On Monday, September 2nd, a party of members visited, by invitation of Messrs. Wilkinson and Mason, the vineyards of the Messrs. Penfold, at Magill.

CONGRESS DINNER.

The President and South Australian members of the Congress entertained the visitors at a dinner held in the Town Hall on the evening of Friday, September 2nd. His Excellency Sir W. C. F. Robinson, G.C.M.G., Governor of South Australia, dined with the members, and the following gentlemen also received invitations:—His Honor Chief Justice Way (Chancellor of the University), Sir Henry Ayers (President of the Legislative Council), Sir Thomas Elder, the Rev. W. R. Fletcher (Vice-Chancellor of the University), His Worship the Mayor of Adelaide (Mr. E. T. Smith), Mr. R. Barr-Smith, Mr. Symon, Q.C., Professor Ives, and Mr. Tyas (Registrar of the University).

SECTION OF MEDICINE.

Chairman—JOHN WILLIAMS, M.D., Univ. Edin. et Melb.

President of the Medical Society, Victoria; Physician to the Melbourne Hospital; Lecturer on Clinical Medicine and Examiner in Medicine at the University of Melbourne.

CHAIRMAN'S ADDRESS.

READ IN GENERAL MEETING OF CONGRESS ON WEDNESDAY,
AUGUST 31st.

Mr. President and Gentlemen—In taking the chair of the Medical Section, I have great pleasure in congratulating the profession in South Australia on the successful inauguration of this, the first Inter-colonial Medical Congress of Australasia. South Australia may justly be proud that the vigorous enterprise and scientific spirit of her leading practitioners have brought together an assembly so honourably representing the brotherhood of medicine in these colonies. I tender my warmest thanks to the members of the Executive Committee for the distinction which they have conferred upon me by the invitation to preside over this important Section, and to deliver the address in medicine. At the same time I must confess that the pleasure with which I was anticipating my visit to Adelaide, and the opportunity which it would afford of becoming personally acquainted with many distinguished physicians, hitherto known to me only by name, was largely alloyed by a sense of the responsibilities which I must assume in accepting this invitation. This feeling of responsibility was not decreased when I cast about in my mind for some subject on which I might fittingly address you within the limited time at my disposal.

In view of the fact that this is the first Medical Congress held in our part of the world, it seemed to me that I might appropriately take for my subject a brief sketch of some of the *Characteristics of Modern Medicine*, glancing at its development in the past, and at a few of the circumstances which will determine its future progress. In so doing, I shall not be able to bring before you anything startlingly

new, and I trust that the importance of the subject will atone for any weakness which may be found in my presentation of it.

If we ask what is the chief feature of modern medical work, I think the answer may well be—the attempt to grasp the natural history of disease. By this I mean, not merely the establishment of the connection between certain clinical signs and symptoms noticed during life and certain morbid conditions found after death, but the endeavour to trace the whole history of disease in the living body; to learn its origin and its course; to know the laws which govern its progress; to distinguish processes which are compensatory and conservative from those which are harmful and destructive; to recognise the inter-dependence of the several organs in disease; to appreciate the value of the element of time in the development of morbid conditions, and in the determination of the symptoms which arise from them; to rightly estimate our power to arrest or mitigate or guide the progress of disease. Such a knowledge must be the only sound basis of a scientific system of therapeutics.

It will readily be conceded that the progress of scientific medicine has been largely dependent upon the growth of our knowledge of physiology and of exact pathology. It is startling to compare the physiology of to-day, as represented by such works as those of Foster and Landois, and by the practical manuals of the various physiological laboratories, with the barrenness of the physiological teaching which prevailed fifty years ago. So, also, the old speculative pathology gradually disappeared; inquirers soberly tried to place themselves face to face with facts; observations multiplied until Rokitsansky's monumental work appeared—a storehouse of valuable reference, though the accurate descriptions of morbid appearances in which it abounds are encumbered by the intrusion of much vague speculation. Since his time, owing largely to the development of microscopical histology, the doctrines of inflammation and repair have been placed upon sound bases; the studies of tumours, of parasites, and of micro-organisms have given rise to distinct branches of medical science in onkology, helminthology, and bacteriology; and the immense strides which pathology has taken may be easily gauged by comparing the works of Baillic, of Hope, and of Carswell, published about the commencement of the Victorian era, and those of Ziegler and Wilks and Moxon, and with the splendid pathological atlas of the New Sydenham Society, whose only fault is the slowness of its serial appearance.

With this advance on the pathological side, there has been a corresponding development of clinical medicine; gradually, by the labours of an army of workers, the recognition of disease in the

living body has become possible with an accuracy formerly undreamt of. Affections once confounded together have been clearly distinguished, the various types and stages of complaints have been defined, and the existence of many diseases previously unknown has been thoroughly demonstrated. To the progress of clinical medicine, much help has been afforded by instruments of precision; the mere enumeration of the stethoscope, the sphygmograph, the laryngoscope, the clinical thermometer, the ophthalmoscope, and of electricity as applied for purposes of diagnosis, will suffice to indicate how great is the service thus rendered to the clinical investigator.

Thus, step by step, a fuller knowledge has been obtained of the history of disease in the living body, of its origin and course, and of the laws which govern its progress. The gradual character of the advance is strikingly illustrated in the case of enteric fever. At the outset of the present century Broussais recognised the inflammation and ulceration of the intestine; in the third decade Bretonneau localised the lesions in the solitary and agminated glands; yet, for nearly twenty years onwards, Cullen's confused classification of continued fevers into synocha, synochus, and typhus still held sway in Great Britain; and, spite of the protests of occasional observers, typhus and typhoid were still confounded together, the bowel lesions being generally considered as mere complications or occasional accompaniments of the disease. At the middle of the century, however, Jenner, in his masterly papers, definitely mapped out for all time the essential symptoms and morbid appearances in typhus and in enteric fever. In 1857, William Budd, in a paper published in the *Lancet*, enunciated the well-known views concerning the spread of enteric fever to which he had first been directed by the North Tawton outbreak in 1839. Then followed the laborious researches of Murchison and Liebermeister, also too familiar to need recapitulation. Before 1870, Buchanan, Seaton, and Thorne had clearly demonstrated the spread of the disease by contaminated drinking-water; and in that year, Ballard's report on the Islington outbreak proved that milk might be an effective carrier of the virus. Radcliffe and Power and others continued the inquiry, and Cayley's Croonian lectures in 1880 formed a terminal epoch in its history. Not that the end has been nearly reached; for on many points connected with the causation of enteric fever, our knowledge is still far from precise. Perhaps the researches of Gaffky and others will lead to the complete identification of the microbe of the disease, in which case the conditions which govern the multiplication of the organism outside of the human body, and which determine its virulence, might be studied with facility, and information of the

highest sanitary importance might be obtained. Other examples suggest themselves, showing how gradual has been the growth of an accurate knowledge of disease. But, as time presses, I pass on to indicate briefly how this clearer knowledge enables us to distinguish morbid processes whose natural tendency is towards recovery, and which need only the gentle guidance of the physician, from those which endanger life or which pass inevitably to a fatal termination. The fact that many diseases run a definite course, generally ending in spontaneous resolution, while imperfectly appreciated, encouraged the growth of various irregular schools of medicine, which boastfully claimed for their inert or useless remedies the restorative power which belongs to kindly nature. But our fuller knowledge of the history of disease is fast striking at the roots of these fungous excrescences of medical science, and at the same time is teaching us to abstain from unnecessary interference with the natural tendency to recovery.

One great outcome of recent research has been the wider recognition of the principle of compensation in disease. Some examples of its action have long been well known, such as the increased growth of one kidney when the other atrophies; the enlargement of one lung when the other is disabled; the hypertrophy of the muscular wall of the bladder in cases of stricture of the urethra. But the full application of this principle to cardiac disease is one of the triumphs of modern pathology. When I was a student, I was taught to regard hypertrophy of the heart as a thing to be dreaded and to be treated vigorously, whilst dilatation was scarcely mentioned, and only as a matter of subordinate importance. We now know that the intensity of the symptoms and the danger to life in valvular disease are proportionate to the degree in which dilatation predominates over hypertrophy. It may be stated absolutely that hypertrophy arises in every case from the effort of the heart to overcome some increased resistance to its effective action, that it never passes beyond the point of compensation, and that, therefore, it is essentially a conservative process. Cases of chronic valvular disease thus resolve themselves roughly into those with perfect and those with imperfect compensatory hypertrophy.

The varying expressions and degrees of compensation which follow the several lesions of the different valves, furnish one of the most interesting studies in practical medicine. We learn, in the first place, the marked difference between the phenomena of obstructive and of regurgitant disease, the slow progress and the tendency to compensation seen in the former, the more rapid development and difficulty in compensation which characterise most cases of the latter.

The diversity in history, symptoms and tendency between cases of aortic obstruction and aortic regurgitation is generally understood ; but I question if most practitioners appreciate the vast distinction in the same respects between cases of pure mitral regurgitation, which, by the way, are not of frequent occurrence, and cases of simple mitral obstruction, which are relatively common. In mitral obstruction, the hypertrophy of the left auricle, which varies so greatly in degree, is almost purely conservative, and, if sufficient, may establish fairly complete accommodation. In regurgitation, the hypertrophy of the left ventricle is also conservative, yet it tends not only to improve the systemic circulation, but also to increase the reflux into the auricle, and thus add to the backward pressure on the lungs. Even in this case, however, safety lies in the abundance of hypertrophy, danger in the predominance of dilatation. Much remains to be learnt in connection with these problems. We do not know with certainty the mode in which hypertrophy is produced ; we still attribute it vaguely to a general law that increased work brings increased growth. We are ignorant of the means by which nature secures increased growth of the wall of the left ventricle alone, notwithstanding that the blood-supply and a large proportion of the muscular fibres of the ventricles are common to both sides of the heart. Herein there is room for valuable work by inquirers in the domains both of normal and morbid anatomy.

After speaking thus about the main features of heart disease in regard to compensation, I may also remark that when compensation fails, when dilatation is progressing, when symptoms of heart failure are prominent, some of the phenomena, which seem at first sight evidences of danger only, are really, at least for a time, conservative in their nature. Dropsy, for example, is well known to be an expression of the failure of the heart's driving power, and of the defective *vis a tergo* in the venous capillaries. Yet this effusion of serum into the lymph spaces of the connective tissue may lessen the heart's work by diminishing the volume of circulating blood, thus relieving the distension of the right cavities of the heart, and it may perhaps produce more remote benefit by causing a concentration of the blood itself. Whether this is the true explanation or not, I have often noticed an amelioration of the symptoms referable to the heart, concurrent with the development of anasarca. The beneficial results of spontaneous hæmorrhage and diarrhœa during the later stages of heart disease may be quoted to the same effect.

It is by taking such comprehensive views that we are able to render effective aid by therapeutic measures, without unduly checking those spontaneous processes which are in themselves salutary. From

similar considerations, viewed in a wider sense, we are able to understand the confidence formerly reposed in blood-letting in cases of acute inflammation attended with engorgement of the right heart—a confidence which, of late years, has been abandoned in far too absolute a measure. We may also learn to recognise that it is not inconsistent to combine the administration of stimulants with the abstraction of blood—the brandy bottle waiting on the lancet.

Closely allied to the subject last considered is the inter-dependence of the various organs in disease. Some prominent instances of this principle are universally recognised, as for example, the relation of the skin to the kidneys in respect of the regulation of the amount of water in the body. Every one is familiar with the improvement which follows the use of diuretics in hyperæmic affections of the skin, a practice which illustrates in striking manner the value of physiological rest in the treatment of disease. Another example of a different kind may be found in the history of the development of the lungs and the liver. In fœtal life, when the lungs are inactive, the liver is of great size compared with the weight of the body, being charged with the entire duty of excreting the superfluous carbon from the blood. After birth, with the development of respiration, this function of the liver recedes into a less important position; yet whenever the action of the lungs is impeded for any length of time, an increase in the size of the liver may be expected. Another illustration may be taken from physiology, in the history of the formation of urea; the first steps in the destructive metamorphosis of albuminoid substances within the body are very obscure, and doubtless take place in all parts of the system; yet the liver has apparently some pronounced share in the earlier stages of this metabolism; for in acute atrophy of the liver, as we all know, the urea disappears partly or entirely from the urine, being replaced by the less oxidised products, leucin and tyrosin. In all cases of chronic atrophy of the liver there is a tendency to compensatory enlargement of the kidneys; and in jaundice, when the elements of bile are accumulating in the blood, the kidneys to the utmost of their power will assume the excretory functions of the liver.

The best example, however, of the inter-dependence of organs in disease is undoubtedly furnished by the history of cases of atrophic interstitial nephritis—the red granular contracting kidney. Here there are primarily three elements, varying in their respective values—the thickening of the coats of the renal arterioles, the atrophy of the urinary tubules, and the growth of fibro-cellular, or densely fibrous tissue, between the tubes. Two results should follow

—obstruction to the local circulation through the kidneys, and diminished functional activity of these organs. To a certain extent these consequences do occur, but then ensue the remarkable phenomena, with which we are now so familiar. The imperfectly depurated blood stimulates the small arteries to contract, so that a new resistance is introduced between the left ventricle and the capillaries; continued irritation of the coats of the arterioles causes additional obstruction, either as Johnson says, by inducing hypertrophy of their muscular coat, or according to Gull and Sutton, by irritative changes, ending in arterio-capillary fibrosis. The left ventricle has, from an early stage, sympathised with these changes. In response to the increased resistance it contracts more forcibly, and continued forcible contraction leads to hypertrophy. Thus blood tension rises, so that, notwithstanding the obstructive changes in the kidneys, urine is excreted in large quantity, though of low specific gravity. In this manner, by the inter-action of the kidneys, the small arteries and the left ventricle, a remarkable compensation is attained, a condition in which the patient is not aware of any illness—nay, rather, in which he feels his bodily and mental powers in fullest vigour, and perhaps executes the most notable parts of his life-work. Yet the recognition of the patient's condition is not difficult, if attention be once drawn to him by some intercurrent illness. The abundant urine of low specific gravity, the hypertrophied heart, the tense slowly recoiling pulse, conjoined with the relatively weak capillary circulation, are sufficiently suggestive. The high blood tension brings with it the dangers attendant on overstrain of the vessels—atheroma, aneurism, hæmorrhage, apoplexy; all incidental inflammations or injuries will tend to disturb the compensation which has been attained, and will themselves, in nearly all cases, be seriously modified in their course. At a later stage, the whole aspect of the case changes. The over-worked heart, having increased to sixteen, or twenty, or even twenty-five ounces in weight, begins to fail, perhaps through primary degeneration of its fibres, perhaps through atheroma of the coronary arteries and defective nutrition consequent thereon. Notwithstanding that the peripheral resistance afforded by the contracted thickened arterioles still continues, the failure of the heart is evidenced by the falling blood tension. The strain is removed from the vessels, and the risk of aneurism and apoplexy are over; but an ominous and progressive fall in the quantity of urine excreted heralds the new danger of defective nitrogenous elimination, and the establishment of that ill-understood condition, too well known by all of us in practice under the name of uræmia.

I have traced the history of these conditions, with which you are all familiar, at what may appear to be unnecessary length, in order by it to lay stress on the important part which the physician should play in directing the life of a patient in whom such complicated processes of organic failure and compensation are at work. In the more advanced stages of such conditions the patient's attention may be drawn rather to his digestive organs, or to his respiratory apparatus, than to the true source of his trouble. In the early stages he will probably be little conscious of any abnormal condition. Suspicion of the real mischief would be entertained only by the watchful family medical attendant; and herein is an example of the great importance of this office, and of the folly of those patients, unfortunately too numerous, who think that in the multitude of counsellors there is wisdom, and who wander from one practitioner to another, seeking help and finding none. There is herein also a warning to the physician not to be satisfied with a scrutiny of the prominent symptoms on account of which patients present themselves, but to deal with the constitution of each patient as a whole; and, whenever any ailment presents unusual features or unexpected difficulties, to be on the watch for those constitutional conditions whose existence may be hidden by such compensatory changes as those which I have attempted to describe.

The importance of the element of time in the natural history of disease has already indirectly attracted our attention in connection with processes of compensation and adjustment. Simple and familiar instances will suffice to demonstrate its intimate relations, not merely to the course of pathological processes, but to diagnosis and treatment. Thus, a small aneurism of the aorta, growing rapidly, often produces far more severe symptoms than those manifested when a huge sac has slowly displaced and distorted the surrounding structures. The intensity of the early symptoms indicates the essential lines of treatment; acute aneurism generally occurs in robust persons with high blood tension—persons impatient of restraint, who, if left to themselves, would speedily sacrifice their last small chance of recovery. Absolute rest and decided reduction of blood tension, by leeching, or preferably by venesection, constitute the only scientific treatment; whereas, with a large slowly-formed aneurism, while rest is necessary, such abrupt lowering of the patient's strength would be distinctly injurious. Similarly, some hydatids gradually attain a considerable size while their hosts are unaware of their presence; others, more rapid in their progress, attract attention by their pressure effects when comparatively small. Insidious growth to a large size probably involves the presence of a densely fibroid

adventitia, and thus gives warning that collapse after tapping will be difficult, and that special attention must be paid to drainage. On the other hand, especially in pulmonary cysts, rapid growth brings with it the danger of spontaneous rupture, but promises speedy collapse and cure after paracentesis.

One great source of error, both in prognosis and in treatment, springing from want of due appreciation of this element of time, lies in the vagueness of the term "chronic," as applied to disease. Thus it may imply prolonged duration, or absence of marked fever, or freedom from so-called "acute" symptoms. The current use of the phrase "chronic phthisis" will illustrate my meaning, for under this denomination are placed morbid processes of widely different character, so that the term "chronic" not unfrequently masks a steady and not slow progression to a fatal issue.

The diversity of the processes of "back-working" in cases of mitral obstruction and regurgitation furnishes one of the best examples of the influence of the element of time over the history of disease. In mitral obstruction, the primary lesion is almost always gradual in development; opportunity is provided for decided hypertrophy of the left auricle; the slowly augmenting tension in the vessels of the lungs leads to dilatation of the capillaries, overgrowth of the interlobular connective tissue, copious deposit of pigment, and all the phenomena of brown induration. The embarrassment of the pulmonary circulation is so insidious in its progress that the right ventricle has abundant time in which to hypertrophy. Such hypertrophy is clearly conservative, as it prevents for a long time any serious interference with the systemic venous currents; but it brings new evil by aggravating the tension in the pulmonary vessels, adding to the distressing sense of fulness in the chest, and increasing the tendency to hæmorrhage. When the ventricle dilates, and the tricuspid valve begins to leak, the lessened strain in the capillaries of the lungs is often welcomed by the patient as a relief; yet this temporary ease is but the precursor of systemic venous engorgement. The slowness of the failure of the right heart permits the typical development of the tough, dark nutmeg liver, a development which may attain such a degree as to determine the occurrence of ascites, while anasarca is still inconsiderable. On the other hand, in most cases of mitral regurgitation, the rapidity with which "back-working" is established induces œdema of the lungs rather than brown induration, and dilatation of the right ventricle rather than hypertrophy, while the relatively early incompetence of the tricuspid valve soon brings into prominence the phenomena of general venous engorgement.

To rightly estimate our power to arrest or mitigate or guide the progress of disease. This is the consummate flower of medical science. Exact diagnosis and prognosis have their own especial values, even apart from all question of treatment; but it is by the power to arrest disease, to prolong life, to relieve suffering, that the medical profession must justify its existence. Various are the agents which we must employ for these ends, various our real knowledge of the agents which we use. No small part of our treatment is still empiric, based only on experience of results; yet year by year the science of rational therapeutics is growing wider and more precise; the chemist, the physiologist, the pathologist, and the physician now join hand in hand; and, far off, we look forward to the time when the mass of undigested facts and details which now embarrass us shall have passed through the crucible of the minds of other generations, and shall be cast in perfect mould, embodying in the just proportion of its different parts that natural history of disease of which I have feebly tried to speak.

Briefly then, let me, before ending my remarks, indicate some of the means whereby we may favour the progress of medical science and of the healing art. In the first place, it is absolutely necessary that the physician and the pathologist should work together; otherwise the observations of both are imperfect and of comparatively little value. Now and then a man like Bright, abounding in energy, becomes eminent in both these spheres, and leaves an imperishable name for his services to medicine. But, as a rule, the tendance of the living and the examination of the dead must be entrusted to different officers. Collation of their respective records is good, but it is not the best. There is needed a thorough sympathy, an active co-operation in inquiry between physician and pathologist, which shall lead each to assist, to verify, to correct the work of the other. I fear that such union is far from common, and I therefore urge this consideration upon the notice of the officers of our metropolitan hospitals, and the teachers of our medical schools, who almost alone have the opportunity to co-operate in such manner.

But, though the large hospital is the natural home of medical inquiry, it has its own inherent defects, in that hospital practice deals with a patient only during some very limited portion of his career. The causes of disease, the influence of family tendency and of personal surroundings, the connected history of patients from birth to death, the questions of idiosyncrasy in treatment, all these form the domain of inquiry for the private practitioner. In these matters, too, the country physician has many advantages over his confrères in the larger cities and towns; he has more accurate and

continuous knowledge of his patients; he deals with questions in simpler form, and hence his observations should be most valuable. Without doubt, the present isolated professional life of the bulk of country practitioners involves a grievous waste of useful knowledge, which should be conserved for the general good. The remedy would seem to be the adoption of the system of collective investigation. At the Copenhagen Congress in 1884, Sir William Gull explained the work which was being done by the Collective Investigation Committee of the British Medical Association. Fifty sub-committees had already been formed in the United Kingdom, including a thousand members. At the close of his eloquent address, it was resolved to form an International Committee for the Collective Investigation of Disease. The various countries of Europe, with North and South America, are represented on that Committee. Might not one result of this Congress well be the formation of an Australasian Branch of that Committee, so as to give purpose and method to the observations of the general body of our practitioners?

Lastly, in addition to co-operation between the workers in the vast fields of research afforded by our hospitals, and to some method of collating the experience of physicians in all parts of the colonies I would in a few words refer to the necessity for special inquirers. The life of Duchenne aptly illustrates my meaning. Early acquiring a taste for electro-therapeutics, and finding no scope for his inquiries at Boulogne, he proceeded to Paris in 1842, and there set himself to the study of the nervous and muscular mechanism in health and disease. He accepted no official appointment, but wandered through the various hospitals, eagerly investigating all cases that bore upon his studies, following them up from hospital to hospital and to their private retreats, and thus at last left behind him that series of discoveries which is a treasured heirloom to succeeding generations.

Is not the time coming in the history of these colonies when special research shall be, not the characteristic of a few workers widely scattered from one another, but a spirit moving everywhere, impelling the best minds to bend themselves with all their energies to add something tried and sure to the sum of human knowledge? Thus may we aid in realising the words of Graves, true to some extent even in his day, more true now, but pregnant with hopeful prophecy for the future:—"The reason of man is now more fully employed than at any former period; a vast store of mental power, a vast mass of mind is everywhere at work; what formerly was vainly attempted by the labours of a few is now easily accomplished by the exertions of the many. The empire of reason, extending from the old to the new world, from Europe to our antipodes, has encircled the earth:

the sun never sets upon her dominions; individuals must rest, but the collective intelligence of the species never rests; at the moment one nation, wearied by the toils of day, welcomes the shades of night, and lies down to seek repose, another rises to hail the light of morning, and refreshed, speeds the noble work of science."

The PRESIDENT said—I am, I know, but speaking the minds of all present when I say how deeply we are indebted to Dr. Williams for the able manner in which he has brought before us both the general principles and also the concrete facts in the progress of medicine, for the suggestive hints he has thrown out, and for the good advice he has given, which, if we take, we shall all be the better for. I am also speaking the mind of the Congress when I say that Dr. Williams and ourselves are under great obligation to Professor Allen, for the splendid style in which he gave the author's work showed that he completely entered into the spirit in which it was written.

Dr. THOMAS DIXSON (Chairman of Section) then presided, and the following paper by the Hon. J. M. CREED was read:—

FEAR AS A FACTOR IN PRODUCING MANY OF THE ALARMING SYMPTOMS FOLLOWING THE BITE OF AUSTRALIAN SNAKES.

[By the Hon. J. M. CREED, M.R.C.S., L.R.C.P., &c., M.L.C., Sydney, N.S.W.]

During the course of my practice in New South Wales, I have had under my care ten cases of snakebite, the sufferer in every instance making a perfect recovery without having been in a single instance subjected to the energetic treatment which, if the accounts given in the lay newspapers are true, is that so generally adopted in such cases. Unhappily we but rarely have the opportunity of perusing an accurate report of these cases from the medical men under whose care they have been, and speaking as the editor of a medical newspaper, I desire to express my regret that our professional brethren do not make such notes of each case which comes under their care as would enable them to report it to a Medical Society for discussion, or to a professional journal for publication. Of these ten cases there are three which are so characteristic of that phase of danger from the effect of snakebite which I wish to bring before this meeting that I think it will be unnecessary for me to give any detailed account of the others. The first of these was that of a strong healthy man, H. D., bitten by a snake—which he called a whip-snake—on the instep, just above the front of a low boot, who came at once to see me at my house. I, seeing the man galloping up, went outside to meet him. He got off his horse, staggered up the garden walk to the verandah,

where I was standing, telling me he was bitten by a snake, and begging me to do something for him. He was pallid and faint, his pulse weak, frequent, and irregular, and he could hardly speak. I put a tourniquet round the leg above the bite, and at once excised it. At the bottom of the wound was a drop or so of a yellowish fluid. I washed the cut well with warm water, and encouraged moderate bleeding, giving the man an ounce of brandy with water, encouraging him to be plucky and get over his fright, telling him that I did not fear any danger, as I had cut out the bite properly, and I did not think any of the poison was absorbed. I estimate the time between the infliction of the bite and its excision at about twenty minutes. I then, finding his colour becoming natural and his pulse getting better, purposely left him for a short time—about fifteen minutes—to bathe the wound and attend to it himself. I kept him at my house about an hour and a half, seeing him occasionally, removing the tourniquet at the end of an hour; then finding him perfectly recovered from his state on arrival, I let him go home. I saw him for a time at intervals of a week or so, but he showed nothing unusual in his health. The wound was a little troublesome in healing, but this I fancy depended partially on its position on the instep just at the bend of the ankle.

In the second, a girl, J. W., of about twelve years of age, was bitten by a large black snake on the side of the foot when walking without shoes or stockings near the creek bank. The piece was excised at once, and she was watched and attended to by a Church of England clergyman and another gentleman (a magistrate of the territory), who gave her small quantities of brandy at intervals. By the request of her friends I was sent for, a distance of thirty miles, the messenger informing me that it was feared the girl was dying. I rode out as quickly as possible, but did not arrive until more than twelve hours after the infliction of the bite. I arrived at the place where she was about 2 a.m., and found her in a semi-comatose state, only to be roused with difficulty, with dilated pupils, cold clammy skin, feeble and irregular pulse of about 130, and convulsive twitchings of the muscles of the whole body. After examining her and very carefully going into the history of the case, I decided that the bite had been promptly and efficiently excised, that none of the poison had been absorbed, and that she was not suffering from the effects of snakebite as her friends and herself supposed, but that all symptoms present were consequent on fear, and that could I convince her that she was in no danger of death from snakebite they would disappear. To do this I carefully abstained from doing anything in the way of treatment either to the wound or by administering anything inter-

nally, and assured her positively that I believed her in no way to be in danger from snake poison, and as proof of this pointed out to her I was not doing anything, as I considered it unnecessary. After some little time I convinced her, and she gradually commenced to recover, sitting up within an hour and asking for food, which was given her, none of the previous bad symptoms remaining, except the muscular twitching of a choreal nature, which lasted for a few days. I need hardly remark on the astonishment and satisfaction of her friends on the effect of my moral treatment.

In the third, J. V., an adult, whilst at work amongst prickly pears was bitten about 10 a.m. on the outer and upper part of the thigh by a brown snake. He at once got the bite excised, and rode in some six miles to see me. Unfortunately I was away, when he applied to a chemist for advice, who took the patient under his care, and treated the case with alcohol until about 9 p.m., when he sent for the police, and begged them to remove the man from his house, as he considered him to be dying. The sergeant of police came to tell me of the case, and asked what he should do. I told him to take the patient to the Scone Hospital, where I would treat him.

On his admission I found him insensible, with dilated pupils, complete relaxation of the muscles, a temperature two degrees lower than normal, and smelling very strongly of spirits, which I was informed had been administered to him in very large quantities. As on examination it was evident that the bite had been effectually excised, I decided to empty the stomach of the alcohol as the most urgent thing to be done, but this fortunately he saved me from the necessity of doing by vomiting a large quantity of almost pure brandy. Believing the stomach to be completely emptied, I had him put to bed, well covered with blankets, with hot bottles applied to his sides, legs, and feet, leaving him quietly to sleep off the effects of the liquor, much to the horror of many of his friends who accompanied him to the hospital, and who were waiting outside in expectation of his death. Next morning I found him recovered, with the exception of the usual consequences of alcoholic excess.

To the whole of the ten cases, all of which completely recovered, I administered but a very small proportion of alcohol, about two ounces of brandy amongst them all, and no ammonia directly into the circulatory system. It will also be seen that the two cases which showed the most serious symptoms, those which, according to popular belief, and, I think, in the opinion of many of our professional brethren, are specially indicative of the toxic effect of snake-bite, were J. W. and J. V. Those in the first I diagnosed as being produced by the effects of extreme fear, my diagnosis being

proved correct by her recovery immediately on being convinced that she was in no danger from snake poison. In the latter the bad symptoms were absolutely dependent upon acute alcoholic poisoning, consequent on the excessive quantity which had been given, through ignorance, in the treatment of the case. In this case I aroused considerable astonishment and dissatisfaction amongst the bystanders by allowing the patient to go comfortably to sleep, after his stomach was freed from the alcohol it contained, instead of carrying out the usual treatment, which consists principally in preventing his doing so. This, however, I soon put an end to by directing the police, who were present, to clear the place of every one, and so leave the patient to lie undisturbed. In the first of these two cases I am convinced that had I attempted to do anything in the way of treatment, the girl would have died from the depression produced by the terror under which she suffered, and which nothing would have convinced her had no legitimate foundation, had I not purposely avoided doing anything, in order to give her practical proof of the sincerity of my belief. As examples of the effect which may be produced by the terror with which almost everyone, more or less, regards a bite from a supposed venomous snake, I will quote one or two cases related to me by personal friends. The first happened some years since at Dobroyd, in the neighbourhood of Sydney, and the circumstances came under the personal cognizance of Dr. E. Ramsay, the able Curator of the Australian Museum, who informs me that he well remembers a strong man being bitten on the hand by a snake-like lizard (*Pygopus lepidopodus*), whose bite is absolutely non-venomous. This has been decided by Mr. Haswell, M.A., the demonstrator in comparative anatomy at the Sydney University who kindly made a special examination of the structure of this reptile for me. This man, though assured of the innocuousness of the injury, would not be convinced of the truth of these assertions, and at his request the bite was excised and the wound cauterised. Notwithstanding, nothing could allay his fear, he sank gradually, and died in a few hours—actually killed by pure fright.

The second was a case which occurred in the practice of Dr. Grigson, now of Muswellbrook, who kindly furnished me with the particulars, which I will give in his own words:—"Early in 1873, the late Dr. Hill, of Lambton (with whom I was then staying), and myself were sent for to go to a case at Dark Creek, about half-a-mile from the surgery. It was reported to be a case of snake-bite. We rode off at once, and found the patient, a young married woman, lying insensible on the bed, surrounded by several friends. The only history we could get was that she had been at the back of the

cottage, and suddenly shrieked out that she was bitten by a snake, immediately falling down insensible. She was carried inside, and medical assistance sent for at once. No one knew where she was bitten, but it was thought somewhere in the upper extremity. When we saw her she was lying on her back, her pulse imperceptible, respiration shallow and sighing, the pupils very dilated; urine and fæces had escaped involuntarily. We searched carefully but could find no marks such as a snake would produce, but on removing one stocking we found a sharp splinter of wood, which had penetrated the calf. We left it in, as we were now tolerably convinced that it was a case of fright. We used the ordinary restoratives (amongst others an enema of turpentine), which, after a time, restored her to consciousness. We then learned from her that she felt a sharp pain in the leg whilst treading on some iron-bark timber, at the same time a large black snake crawled out and escaped into a hollow log close by. She thought she was bitten, and remembered no more. We showed her the splinter in the calf of her leg, and removed it with a pair of forceps, when the anxiety passed away from her countenance like magic. She was, however, in bad health for some time afterwards. While we were talking to her the men found a large black snake in a log close to the spot. I may add, that when first seen, both Dr. Hill and myself thought our patient would die in a few minutes."

In addition to these cases, which happened in New South Wales, Sir Joseph Fayrer records at least two cases in India, in which urgent symptoms were present, supposed to be consequent on snake-bite, but shown by the examination of the snakes, which were of a harmless kind, to be due to the effects of fear; the cases having been treated by the administration of ammonia and rum, the remedies in question were credited with their cure. Another even more remarkable case is given by him. Mr. J. C. Douglas, Teacher of Science in the Department of Science and Art, Eastern Bengal, reported that a man in his employ was bitten by a small mammal, which, by native belief, was credited with venomous properties. In less than five minutes after the infliction of the bite the patient was senseless, and it was six hours before he could walk, and upwards of thirty hours before he could be considered to have recovered, though even then still very weak. The animal was examined by Dr. J. Anderson, Curator of the Indian Museum, who reported that it was perfectly harmless, and incapable of inflicting a venomous bite, and that, moreover, he had a personal knowledge of two bites being inflicted by animals of the same species, one being on himself, and in neither of these did the smallest ill-effect follow. It

is, therefore, obvious that the very great constitutional injury which followed the bite was purely the result of nervous terror having no just foundation.

As a contrast to these cases, which presented all the well-marked symptoms which in the popular idea are so absolutely indicative of the absorption and active effect of snake poison, I will relate the case of D. M., aged 18 years, a strong healthy lad, who on September 23rd, 1879, was at 1.30 p.m. bitten by a large brown snake. The wound was cut and freely sucked, some brandy was given at intervals, and brandy and salt applied to the wound. His friends, in their evidence before the police magistrate, who held the inquiry on the body, said that he was not afraid, as he believed the bite had been effectively excised (which, unhappily, was not the case), and he had no doubt as to his ultimate recovery. Until 9 p.m., a period of seven hours and a half after the infliction of the bite, he showed no symptoms of drowsiness. At that time he wished to sleep—a very natural thing for him to do, he having been up since daylight, and, until he was bitten, actively employed. From then until midnight the bystanders kept him awake, but after this to about 8.30 a.m. of September 24, he showed no inclination to sleep. At this time he went to sleep, and slept calmly for half an hour. He then woke up, appeared very weak, and died in about half an hour more, at 9.30 a.m. He vomited two or three times about 30 minutes after he was bitten. He was given small quantities of brandy at intervals, but received no other treatment, except the ineffective attempt at excision of the bite. He was never insensible and never had any convulsions. I was sent for shortly before his death, but did not arrive until after his decease. I examined the body externally, but found nothing to arouse attention. On examining the wound, which had been made in the attempt to excise the bite, I found it had only removed the thickened cuticle and a portion of the true skin just above the junction of the sole on the outer side of the left foot, not going deep enough to reach entirely through the skin into the cellular tissue, the punctures of the fangs being visible at the bottom of the cavity produced. The poison had evidently been injected much deeper, and none had been removed. Circumstances I could not control prevented me making a complete post-mortem examination.

From the experience which I have had of cases of snake-bite in New South Wales, and from inquiries I have made as to the particulars of others which have occurred in the practice of my friends who have kindly given me an account of them, I have been obliged to arrive at the conclusion that, with the exception of the larger species of Hop-

locephalus, especially the "large-scaled snake," or, as it is called in Tasmania, the Diamond snake (*Hoplocephalus superbis*), and the brown banded or Tiger snake (*Hoplocephalus curtus*), the death adder (*Acanthophis antarctica*), the brown snake (*Diemenia superciliosa*), and a large and vigorous specimen of the blake snake (*Pseudechis porphyriacus*), the danger of death from the effects of the bite of the numerous venomous snakes common to the colony is very much exaggerated, and that in the majority of cases showing serious symptoms, these symptoms are really the effect of intense fear and not of snake poison. It is also impossible to arrive at any other conclusion than that arrived at by the illustrious Sir Joseph Fayrer, who after numerous and exact experiments, says, "I do not say that a physiological antidote is impossible. All I assert is that it has not yet been found." It is, therefore, essential that the object to be attained in the treatment of every bite from a venomous snake is the prevention of the absorption of the poison, and this can only be done by the stopping of the circulation as quickly as possible between the bite and the heart, and the prompt and efficient excision of the punctures to such a depth as shall insure either the absolute removal of the injected poison, or, at all events, its exposure to such an extent that it can easily be removed by washing with the nearest attainable fluid, preferably water.

I strongly insist on the advantages of the excision of, instead of incision into and about, the punctures caused by the teeth of venomous snakes for the following reasons:—As the longest poison fang of the largest Australian snake is less than one-fourth of an inch in length, excision of the very lowest point of the puncture is easily practicable by any intelligent person in the manner I later on describe, without danger of causing more serious hæmorrhage than can easily be controlled by the application of a pad. If done in this way the whole of the poison will be removed. On the other hand, incisions made into and about the wound may or may not remove the venom, which might easily be retained at the original spot into which it was injected by the bite, if the cut made did not actually enter into and freely expose it. In addition, the danger from hæmorrhage would be very much greater from the wound made by the incision, as the point of the knife would probably enter to a greater depth than the wound made in excision. In fact, unless the operator had a fair knowledge of anatomy, he might easily in many places wound an artery lying comparatively superficially, and cause death by hæmorrhage in a few minutes. With regard to sucking the wound, I would remark that the entire removal of the poison by its means is problematical, and Sir Joseph Fayrer's inquiries show that such treatment

is not without danger to the person sucking. Unless made by a person with some knowledge of anatomy, I think the excision should be made by pinching up the part to be cut away, and then removing it with the middle of the blade, and not by inserting the point of the knife and cutting round the bites.

In giving directions for the excision of a snake-bite it is necessary for us to recommend some method which is practicable by any person wherever he may happen to be, and not to suggest means which are only capable of being followed out by an educated surgeon with an ample choice of instruments. Therefore I recommend what has often been recommended before, the tying of a strong ligature on the limb above the wound, and the tightening of this by putting in a piece of stick and twisting it so as to produce as nearly as possible for a moderate time absolute stoppage of the circulation. This, no doubt, would be best done by a strong elastic band or piece of india-rubber tubing, if quickly procurable. After this is done (or before, if the bitten spot is one to which a ligature cannot be easily applied) the bite should be taken hold of firmly between the finger and thumb and the piece grasped removed, together with the subjacent fat, by cutting round the points of the digits with the sharpest instrument available. The wound should be well washed and moderate bleeding encouraged. If obtainable, after this a 5 per cent. solution of permanganate of potassium should be applied, or Condry's fluid, in an undiluted state, this being a weaker solution of that salt. Failing this the wound might have strong nitric or carbolic acid applied, to be quickly washed off again, or actual cautery by a hot piece of iron or a red-hot ember. Dr. Lacerda, in Brazil, recommends the injection of the 5 per cent. solution of the permanganate of potassium into the punctures caused by the snake, and into the surrounding tissues, as also into the system by injection into a vein, if the symptoms show that the poison has reached the general circulation, though he expresses some doubt as to the probability of its efficacy under these circumstances; whilst Sir Joseph Fayrer, who, by experiments made as far back as 1869, discovered that this salt was an effective chemical antidote, so far as the destruction of the active power of the poison if brought into direct contact with it, is concerned, is of opinion that when thrown into the general circulation it can do but little good, for it will not attack the snake poison solely, but will oxidise all organic matter with which it comes in contact. Dr. Richards, who has published a pamphlet on the use of permanganate of potassium in snake poisoning, considers it the best local application; but it can only act if brought into direct contact with the poison, and this result, by mere injection into the wound and surrounding tissues, is so problematical as to

render the excision of the bite first and the application of the permanganate afterwards the proper course to be pursued, and this is the opinion of Sir Joseph Fayrer. After the poison has been excised and the surrounding tissues acted on as thoroughly as possible by permanganate of potassium or other remedies, the ligature should be relaxed. The patient should be carefully watched, and the prominent symptoms be treated as they arise. He should be kept warm, allowed to rest, and to have when necessary stimulants judiciously administered by the mouth as long as he is capable of swallowing, and failing this, by hypodermic or rectal injection. Under these circumstances I think ether under the skin the best, or brandy and water by enema. My experience has told me that there can be no greater mistake than the infliction of pain and that compulsory exertion of walking about, to which patients are recklessly subjected with a view to keeping them awake.

Sir Joseph Fayrer expressly says, "do not walk the patient about." Some of the expedients resorted to for the purpose of preventing sleep are perfectly ludicrous in their absurdity. In one instance reported in a country newspaper in New South Wales the thanks of the Municipal Council were conveyed to the town band for its exertion in keeping a patient awake, the patient, it was stated, making a good recovery both from the effect of the snake poison and from the infliction of the band. The treatment adds to their terror, depresses their vital powers, and I am certain is not only unnecessary, but lessens the chance of recovery. Another thing to be guarded against is the reckless exhibition of alcohol without the excuse of a failing pulse. This is often done to such an extent as to produce urgent symptoms of acute alcoholic poisoning. In one case which recently occurred near Melbourne two bottles of brandy were administered to a man in about three hours after being bitten, the symptoms as reported being evidently the result of alcoholic poisoning. In another case, which happened during the present year in New South Wales, a young girl of about nineteen was bitten by a snake. She was taken rapidly to the nearest doctor on horseback, and in a buggy a distance of some 40 miles, four bottles of brandy being administered to her during the journey. As might well be expected, she was at death's door, but ultimately recovered. I think no one will doubt that in this case the patient's peril was infinitely greater from the reckless administration of alcohol than from the snake-bite, and that nothing but the repeated vomiting of the swallowed liquor could have saved her life.

By experiments both by various observers in India, and also as far as regards the Australian snakes by the late Mr. Krefft, in Sydney,

it has been demonstrated that no effect follows the infliction of a bite by one of the most venomous snakes either on itself or on another venomous snake of the same or a somewhat similar class. This, I think, goes to show that if a physiological antidote is to be discovered, it must be sought in this peculiar property inherent in the snakes, which can hardly be merely consequent on structure, but may be the result of some substance diffused in the snake itself, which diligent research may demonstrate to be capable of isolation, and, if so, of use in the treatment of snake-bite. The remarkable fact demonstrated by Sir Joseph Fayrer that the blood of an animal killed by snake poison is in itself so poisonous as to cause the death of any animal inoculated with it and so on in a series of at least three, is astounding, and the death of the second, much less the third, cannot be consequent on the original poison first injected merely diffused through the blood of the two first animals, for diluted as it would be in the first victim to the extent of at least one in three thousand, and in the second one in nine millions, it is absurd to suppose that the original poison injected is the immediate cause of death, but that this demonstrates that snake poison, when injected into the blood, has a suitable menstruum for its continual multiplication, and that it is really a substance with properties akin to a ferment, which under favourable circumstances multiplies itself.

With the foregoing facts as a basis, I think we are justified in saying that the snakes of Australia are not nearly so potent in their power to kill as those of India; that fear is one of the principal causes of many of the most urgent symptoms which are present when a patient is bitten by a snake; that at present there is no physiological antidote to snake poison known, and that the chemical antidotes, to be effective, require to be brought into direct contact with the poison itself, and that failing this they are failures; that the only really effective means of averting serious consequences is by the prevention of the absorption of the poison; that this will be best done by the early stoppage of circulation in the wounded limb, and the prompt excision of the bite; that subsequent symptoms should be watched for, and treated on ordinary principles; that the reckless administration of alcohol and the infliction of suffering and exhaustive exercise on the patient is to be earnestly condemned, and that the most likely course of treatment to follow for the remedy of these symptoms would be something which would stimulate and sustain the vital powers of the patient, and at the same time remove the feeling of dread from which he suffers. This, after consideration, I have come to the conclusion would be best done by the administration of ether by inhalation to anæsthesia; by this means the patient

would have administered one of the best stimulants, and at the same time, by being rendered insensible, would have his fear and its terrible effects quickly removed. I would suggest that it be administered (just so as to keep the patient unconscious) for, say, one or two hours, when he might be allowed to recover sensibility to such an extent as to enable the surgeon to judge of his condition, his pulse and respiration being carefully watched the whole time. After this, should it be necessary, he might be brought under the influence of the ether again and again, so long as might be required. I cannot help thinking that in this suggestion there is the germ of useful treatment for many cases of snake-bite in the human subject.

In confirmation of this I will quote from a letter written to me by Sir Joseph Fayrer, K.C.S.I., in September, 1884, after reading a report in the *Australasian Medical Gazette* of a previous paper of mine on the same subject. He says—"You are quite right in your estimate of the action of fear and the mortal effects in the cases of many who are bitten. I think it probable that the mode of treatment you suggest might be of use in cases where only a limited dose of the poison has been inoculated; but I fear in cases where a full dose of cobra poison has entered the circulation that we can do little, if anything, towards averting a fatal result. I hope you will give the ether treatment a good trial, and let me know the result."

The treatment of snake-bite by the inhalation of ether has been tried by Dr. Baneroff, of Brisbane, the result being most encouraging. I may say that practising as I do in Sydney, no case of snake-bite has come under my care since I suggested the inhalation of ether, and that therefore I am unable to speak personally of its actual effect. I trust that those of our professional brethren who have the opportunity will see their way to give it a crucial trial.

GRINDELIA ROBUSTA (Nutt).

[By THOMAS DIXSON, M.B. et CH.M., EDIN. (Lecturer on Materia Medica, Sydney University).]

SYNONYM—Hardy Grindelia; Wild Sunflower.

NAT. ORD.—Compositæ.

HABITAT—California.

The fluid extract of *Grindelia robusta* is one of the many drugs which have been specially pressed upon the attention of physicians by the firm of Parke Davis as an American specialty. Most of these for one reason or another do not seem to have produced in

Britain at any rate any very marked effect, but the one above mentioned seemed of sufficient interest and clinical value to demand a pharmacological examination. But as its history threw some light upon its nature, we must consider it as shortly as possible.

For over a hundred years the Jesuit missionaries in California seem to have made some use of it. It grew around them on all sides in moist woods, in thickets on the hillsides. Often close at hand there is found another plant, the Parson Ivy (*Rhus Toxicodendron*), which, as you all know, produces by its touch a severe spreading skin eruption. This agonising scourge our Grindelia seems to have the rare power of slowly subduing.

But more generally of interest are the accounts of the use of the herb in cases of asthma, the first clear reference to which was made (so far as I can find) by Dr. O. V. Smith, in the *Pacific Medical Journal* for 1875. A Dr. C. A. Caulfield has written about in 1864 in the same journal. Dr. Smith describes how in a case of asthma he gave three grains of the herb for each dose. The case dating from childhood and given over by physicians as incurable began rapidly to improve, so that with the coincident improvement in appetite and strength he was able to astonish and excel all others in the village by his powers of hill climbing.

Dr. Squibb, in the *Pharmaceutical Journal* of 1878, states that it is the *G. hirsutula* that is of use in *Rhus* poisoning, and the *G. robusta* in asthma.

When I began my experiments, for certain reasons I gained my specimens from different sources, and though *G. robusta* was ordered, got on one or two occasions plants agreeing rather with Mr. Holmes' description of *G. squamosa*. Yet I cannot say that I noticed any difference in pharmacological effect so far as I had the power to judge, but as the plant I examined was mainly *G. robusta* I speak of that alone.

As regards the habit of the plant, it grows very luxuriously in damp places, but, of course, in dry ones is very much less showy, yet it is only the latter which seems to have any activity. This seems to be due to the resin (which appears as a white exudation on the flowers mainly) chiefly, and which gradually dries to a shining glaze. It seems that the dried plants are not less active than the fresh (C. A. Steele), indicating that the principle is not volatile.

And finally I find it stated that *G. squamosa* is just as resinous and as medicinally active as *G. robusta*, and more so than the other species of *G.*—*Holmes*.

The *G. robusta* has been rendered officinal in America.

CHEMISTRY.—When I took in hand to try and find an active prin-

ciple I naturally searched for an alkaloid or glycoside, but could get none—no physiologically active body aside from the one to be described. Distillation yielded a mere trace of a highly fragrant oil. After exhausting many methods the following yielded a product, showing the active characteristic of the plant:—

The commercial herb (I obtained it from T. Christy, of Fenchurch-street) was soaked in cold strong solution of carbonate of soda several hours. This was repeated till no more of the extract seemed to pass into the solution (judging from its colour). This was then filtered from refuse, and precipitated by an acid. The acid added so long as the solution was at all alkaline, in reaction caused a flocky-looking body to separate, which ultimately settled to the bottom. By decantation, washing with water, filtering, a resinous body was obtained, which was soluble in alcohol, ether, carbonate of soda. This was redissolved in carbonate of soda, much water added, and then reprecipitated by acid. Then ether was added and shaken with it in a flask, and the greenish solution in ether poured off. When tested this body was found to be active. Much resin remained in the flask undissolved, and was when tested inert. Finally the greenish-yellow transparent resin was dissolved in ammonia; dilution with water did not precipitate this. Now, to this dilution acetate of lead was added. Then H_2S conducted in till all the lead was precipitated, and the resin freed again. The result was washed with water. Alcohol was then used to dissolve out the resin, which was now become yellow, as seen when the alcohol was driven off. In short, I found that there were two resin-like bodies in the plant, one soluble in ether; the one soluble in ether—and this, therefore, was soluble in alkalies—being, of course, of an acid nature like other resins. This confirms the current idea that the plants which were resinous were for this reason active proportionately.

PHYSIOLOGICAL ACTION.—This was tried upon frogs and cats. The substance being insoluble in ether, was dissolved in a minimum of a solution of carbonate of soda. It was of necessity, therefore, distinctly alkaline in reaction—a disadvantage, but of course not a material preventive to testing the activity.

In Germany there are two kinds of frogs available for experiment, and on which drugs show differences of action, *i.e.*, *Rana temporaria* (winter frog), *Rana esculenta* (the edible frog). The latter showed convulsions more distinctly than the former.

If 0.03 grammes were dissolved as described in carbonate of soda and injected hypodermically the symptoms are not visible for some hours, beginning in about two, for the frog gets sluggish in his movements. In a short time slight convulsive movements show them-

selves, which are accompanied by a temporary increase of reflex excitability. This soon vanishes. After about five hours all twitching disappears, and the frog lies outstretched, apparently dead. After various periods, varying from 24 to 48 hours, the frog may die or quite recover. Except in the later stages of the poisoning the muscles retain their irritability. Section of the spinal cord below the medulla oblongata did not remove these convulsions, hence they seemed to arise in the spinal cord. 0.068 kills a frog in about twelve hours.

Frog's Heart.—If some of the above be administered hypodermically, or better, if applied to the frog's heart directly, a series of remarkable phenomena show themselves. After hypodermic injection of say 0.08 grammes it appears in three minutes with either species of frog. The action *slows* and strengthens so that the ventricle soon beats only once to every three or four beats of the auricle. The ventricle then shows the "penstaltic action," as it is called, till finally it stops in diastole.

In a Williams' apparatus the same kind of action is seen; but if from an overdose the heart stops, increase of pressure would set it beating again.

Dog.—Injected into the vein of a small dog, .5 seemed to produce no very evident action. In a rabbit 0.4 was similar in inertness.

Cat.—0.2 injected into a vein in the leg of a medium-sized cat threw her into violent convulsions—the thick saliva poured from the mouth, the pupils widely dilated, she uttered cries like a child. At each epileptic-like attack her claws were inturned, and between the main attacks were smaller ones. Soon exhaustion showed itself, and in an hour the animal was dead. There was no external bleeding, though there was some passage of a bloody urine. There was a large blood clot.

On another occasion the same dose to a cat of similar size merely produced stupefaction, dilation of the pupils for about an hour and a half. Meanwhile she crouched, her ears directed forwards, and uttering piteous child-like cries. She could not be frightened.

0.4 on another occasion caused the above symptoms in another cat, but in ten minutes convulsions came on. In two hours she was apparently quite recovered.

0.6 injected into a dog sent it into a state of stupidity, pinching the nose, &c., producing no signs of reaction as it sat half lying on the ground. In an hour it was recovered.

In a blood-pressure experiment upon a cat, rise of blood-pressure exactly like in digitalin was produced, but no amount of the drug up to one gramme killed the animal.

As the amount of resin is not great in the plant, and the activity of the drug not intense, I found my stock exhausted before I could finish off my investigations fully.

DEDUCTIONS.—(1) The plant contains an active principle of a very characteristic nature, containing the action of digitalis with that of a resin acting like camphor. (2) Although all efforts were unable to separate a body like digitalin from the resin, it is probable that it is not the resin itself which shows these actions, but a body dissolved or caught mechanically in it, for none of the many bodies known which act like digitalin are resins, and they are also all very powerful in minute doses. How difficult it is to deal with a resin you all know in the case of Indian hemp. Like it the plant grown in one place has no resin, and is inert; grown elsewhere, it is resinous and active. Like it, the separation from the resin is apparently impossible. You all know the many substances got from the extract of Cannabis Indica—the Cannabin, Cannabinon, Tetanocannabin, &c., yet the resin unhandled remains the active form which one prescribes if he wish the small dose to be efficient. I hope, however, to return soon to reinvestigating the above when I get a new stock.

For the action in asthma it is not unlikely that the central sedative action upon the nervous system is the factor, possibly aided by the action upon the heart. In asthma my friend Dr. G. A. Gibson, of Edinburgh, has found it often invaluable; while the same gentleman has found Euphorbia pilulifera, &c., extract as found in commerce inert.

A FEW NOTES *re* MODIFICATION OF SYMPTOMS IN CENTRAL AUSTRALIA.

[By JAMES P. BAKER, F.R.C.S., ED., &c.]

Having spent about twelve months in a portion of South Australia rarely if ever previously visited by a member of our profession, a few notes from my personal observation may have some interest.

My experience extends from Hergott to the junction of the Macumba and Stevenson Rivers, a distance of 300 miles N.W., on the route of the Transcontinental Telegraph Line, and during the last nine months I have been in charge of the men constructing the Hergott and Strangways Extension Railway.

Of course we have had dysentery and diarrhœa to contend with, partly due to the natural mineral waters; partly to the drunken, dirty habits of the men, and very much owing to the fact that many men were sent up, who from age or a debilitated constitution were totally unfit to stand the work or the climate.

I need not detain you with these too well-known maladies except to observe that my experience leads me to the conclusion, that with 99 men out of 100, the natural springs, with very few exceptions, and all the "bores" yet put down, are unfit for human consumption. I have given copy of analysis of some of them below. As the one disease, or modification of disease, peculiar to Central Australia, I suppose I may mention.

"BARCOO."

Of the meaning of the word, I know nothing. It is probably derived from the River Barcoo, an affluent of the Cooper, on which river this sickness is very prevalent at certain seasons, and is said to be due to the large quantities of water imbibed, and the irritation of the gastric mucous membrane by half-masticated food.

Other authorities amongst my patients maintain with equal pertinacity that Barcoo, also called "The Fly Sickness," is due to the nausea caused by the swarms of flies which invade everything, especially after rains. Of my own theory, which differs from both these, I will speak presently.

After a spell of hot dry weather, with the thermometer ranging from 110° to 120° in the shade from 11 till 4 o'clock, a duststorm sweeps over the vast deserts of sand and stones which extend for miles round the shores of Lake Eyre, and then after hours or days of scorching heat and blinding misery the welcome rain pours down, and seems to open the gates of Paradise to parched-up nature. At such a time, and, I believe, I may say at such a time alone, Barcoo selects its victims.

Symptoms.—In its mildest form the patient sits down with a good appetite, and enjoys a good meal, but towards the middle or end of his repast sudden qualms assail him, and beating a hurried retreat, he is compelled to sacrifice all to Mother Earth. In some of these cases the patient can, after a short time, eat and retain a second meal. In more severe cases, although eager for food, the mere sight of cooked meats produces the most intense nausea, and the hungry patient has to content himself by very slowly nibbling a dry crust or biscuit. These two forms are the most common, and are easily relieved. As an example of the more intense form of the disease, I will briefly relate my own unhappy experience. Soon after leaving

Hergott for the North I had a violent attack of sickness, which knowing nothing of Barcoo, I thought would pass off, but on sitting down to supper that evening with a traveller's appetite, I was assailed with such intense nausea that I had to beat a hasty retreat. At that time I knew nothing of the disease or its treatment, and although soon informed that I was suffering from Barcoo, I was not better off. During the three weeks occupied in driving to Macumba Station the disease retained its hold, and so debilitated did I become that standing on the banks of that stream to take a header into its refreshing waters, I cared not whether I rose again to the surface or not. Like a sufferer from sea-sickness, I felt life was hardly worth living at the price. The symptoms I noticed, besides the persistent nausea and sickness at sight of food, were constipation, which if not relieved, ended in a troublesome attack of dysenteric diarrhœa, and great debility from want of food, as I generally had to confine myself to the driest of biscuits or hard-baked damper, with tea or coffee. I also especially remarked that there were intermissions of some hours, during which I could enjoy and retain my food, and that I was subject to hot and cold fits at irregular intervals, with a variation in temperature of some two degrees, and obscure pains in the back and loins. The rest and kind hospitality of the manager, assisted by the exhibition of some excellent O.V.G., very soon restored me to my normal state of health.

Treatment.—Bismuth may, I think, be regarded as a specific; given in doses of five or ten grains with each meal it is generally sufficient to relieve all unpleasant symptoms. For the sake of convenience I have combined it with tincture of bark and chloroform water, and administered a few doses of compound jalap powder. As a prophylactic, quinine is of undoubted value, but during the attack it intensifies the symptoms.

Remarks.—Coming on as it does after rain, when the ground is steaming with moisture, and noticing its paroxysmal and intermittent character, I cannot but regard it as an intermittent malarial fever, and when it is remarked that as the region of sub-tropical rains and extensive marshes is approached, Barcoo becomes intensified until it merges into true intermittent fever, I think I am justified in concluding that Barcoo is simply fever and ague modified by climatic influences.

EPIHEMERAL DROPSY.

So, for want of a better name, I have called a form of dropsy very common in Central Australia during the summer months. In my limited experience this symptom was new and startling, but possibly

well known to many of you ; still I will very briefly state the disease as I have met with it amongst the navvies.

Symptoms.—The feet and ankles first become œdematous, then the legs and scrotum, and if neglected the abdomen is involved. The scrotum becomes sometimes enormously distended, and together with the swollen legs and feet, present a rather alarming appearance.

Treatment.—A few days' rest, milk diet, a few doses of compound jalap powder, and in more severe cases a week's treatment with iodide of potassium and gentian, has always sufficed to make a complete cure. During the hot dry weather the men drink enormous quantities of water, some as much as three or four gallons during the day ; and then at night, when there is often a fall of 40° or 50° in temperature, expose themselves to sudden chills ; this together with the saline water, containing from 200 to 400 grains of salt to the gallon, must tend to cause renal congestion, and prevent elimination of fluid by the natural outlet.

In conclusion, I will merely mention the very erratic temperatures I have met with up here in malarial fever, ranging in a few hours from 104° or 105° as low as 97° or 98° , and this without any regular intermission, though in the more pronounced form the evening record has generally been 2° or 3° higher than the morning, and this in spite of fair doses of quinine.

COPY OF ANALYSES FURNISHED BY CONSERVATOR OF WATER.

HERGOTT BORE.

				Per gallon.
Sodic and potassic chlorides	...	...	...	85.69 grains
Sodic carbonate	...	...	...	41.70 "
Calcic carbonate	...	...	...	1.61 "

COWARD BORE.

Sodic and potassic chlorides	...	...	...	197.20 "
Sodic sulphate	...	...	...	22.18 "
Sodic carbonate	...	...	...	31.89 "
Magnesia carbonate	...	...	...	6.59 "
Calcic carbonate	...	...	...	12.14 "

STRANGWAYS BORE.

Sodic and potassic chlorides	...	...	...	333.20 "
Sodic sulphate	...	...	...	42.24 "
Sodic carbonate	...	...	...	5.11 "
Magnesia carbonate	...	...	...	16.95 "
Calcic carbonate	...	...	...	2.50 "

A FEW NOTES ABOUT THE FEVER CAMP AT THE ALFRED HOSPITAL.

[By A. S. JOSKE, M.B., Ch.B., Melbourne, Victoria.]

During the years 1886-7 there were admitted into the Alfred Hospital, Prahran, Victoria, 342 patients suffering from typhoid fever. Sixty-nine of these were treated, not in the ordinary wards of the Hospital, but in tents. As this was something novel, the following brief *resumé* may interest you:—

The tents were six in number. Five held four patients each, and one eight, the total number in residence at one particular time being 28. The tents were of common duck. Three, made for service in war time, had proper hoods, making a double roof, the space between the tent proper and the upper roof being about one foot, allowing a free current of air between. There were four doors—that is, four openings—to each, allowing a free draught. The others were similar tents, but had only tarpaulins rigged over them on a wooden framework. The floor of each tent was composed of wooden boards, fitted to the shape of the tent. Gas was laid on to each. The beds were of iron, with wire mattresses and hair palliasses.

Besides the Hospital tents, there were two temporary wooden buildings, each divided into two. One was used as a kitchen and pantry, with a nurses' room; the other as a bathroom and assistant nurses' room. The bathroom had hot water provided by means of an efficient gas heater. The cooking was done by means of a gas stove. The wooden buildings and the tents were all connected by means of wooden gangways.

There were two closets attached, and Hesse's patent pans were used, with carbolized sawdust as a disinfectant. These pans have screw-lids, preventing the escape of any foul gas, and enabling them to be removed during day time.

The temperature of the air varied. At the opening of the camp, in February, the weather was very variable, hot winds prevailing, and though the doors were shut the temperature would only be from four to six degrees below that of the outside atmosphere. By opening the east and west doors the atmosphere inside averaged from eight to ten degrees lower than the outside air. During the night, in the months of February and March, the temperature was always about 60° or 65°, and by opening or shutting the doors it could be regulated quickly.

In April there were several storms of wind and rain, and though nearly one inch of rain fell one night in the end of this month, none was admitted.

During May, however, the nights became very cold and frosty, the temperature falling as low as 38° ; and as no cheap method of warming could be devised, the camp was closed at the end of this month.

Out of the total number of patients admitted, 57 were males and 12 females. The number of deaths was eight—one female and seven males. Four of these died within 48 hours after admission—two from perforation and two from exhaustion.

The following three factors greatly relieved the general symptoms:—

1. The great ease with which the temperature could be lowered during the hot months by simply allowing the cool evening breeze to blow right through the tent.

2. The comparative isolation. So few being together in one tent, there was less liability to disturbance from a delirious case than in the ordinary wards.

3. The ventilation was so much more perfect, the odour from fæces being removed at once by opening all doors, and the danger of re-infection was not so great.

In the wards, during the time the camp was open, there was a marked number of relapses; in the tents the relapses were not so numerous, and at the same time not quite so persistent. Probably this last cause had something to do with it.

The great danger that was feared, owing to the free ventilation, was from lung complications; but this was groundless. Out of the 69 cases three only had pneumonia, but several had the deep congestion that accompanies severe enteric fever. The three cases of acute pneumonia all had a rapid convalescence.

Diarrhœa was a frequent complication during the late epidemic, but was not quite so intractable in the camp as in the wards.

Epistaxis was not so frequent in camp as in wards.

The temperature ran a rather more regular course in camp, probably due to a freer ventilation. The charts, as a whole, showed a greater tendency to morning recessions. I would here like to point out that the typical temperature of Wunderlich appears to me to be the exception, and not the rule, in Australian typhoid.

The death-rate during a corresponding period in the camp and in the wards was—in camp, 11.5 per cent.; in wards, 12.6 per cent.; the total death-rate for the Hospital for the twelve months being 11.4 per cent.—39 deaths in 342 cases.

Lastly, I would like to point out the one great drawback that was experienced. It is that, owing to the tents being separated, a greater nursing staff was required, and the nurses employed found the work more arduous, and felt the exposure to the night air severely.

A DIAGNOSTIC SIGN IN TYPHOID FEVER.

[By A. S. JOSKE, M.B., Ch.B., Resident Physician, Alfred Hospital, Melbourne.]

During the last twelve months I have examined carefully the abdomen of every typhoid fever case admitted into the Alfred Hospital, and have been struck by the almost invariable presence in the early stage of the disease, that is from the seventh to the tenth day, of great enlargement of the superficial epigastric and circumflex iliae veins.

Out of over 300 cases examined, it was not markedly present in only fifteen cases. Before spots appear, I think it is a very good diagnostic sign of some enteric mischief; in fact, in every case of continued fever, of six or seven days' duration, with this sign present, I think the diagnosis can be made almost certain.

The condition may have two causes:—

(1) The distension of the large intestine may cause undue pressure on the external iliae veins, and so backward pressure on the femoral vein, the superficial veins being compelled to carry away the blood.

(2) The mesenteric glands may become so enlarged as to press on the iliae veins. The veins of the right side are more commonly enlarged than those of the left.

I would like to ask whether this has been observed before, and whether it may be due to some cause other than mechanical pressure.

SOME REMARKS UPON THE SOUTH AUSTRALIAN CLIMATES AND THEIR INFLUENCE UPON PHTHISIS.

[By H. EUSTACE ASTLES, M.D., F.R.C.P., Ed., Adelaide.]

From the arrival in Australia of consumptive patients at the wrong time of the year, and in the wrong places, it is evident that the practitioner in England possesses but little knowledge of the climates of this vast territory of ours. The meeting of this Congress affords a fitting opportunity for the medical men from each colony to give the physician at home valuable information upon a subject that must bear strongly upon the prospects of the many who seek by his advice

in Australia renewed health and happiness. A good knowledge of climates should be an essential to the doctor, as is the study of dietetics. But how is this to be properly known if it is left to the passing visitor to report upon ; and this is very much the case as regards Australia.

Statements like the following by the late Dr. Tanner have been productive of much harm :—"Supposing," he said, "the traveller to arrive in Australia about the end of January, he will find the thermometer at 90° Fahr. in the middle of the day, without any unpleasant sense of heat, with a feeling of new life and general exhilaration, and a good appetite ; he will experience a desire to be at work. The difficulty seems to be to persuade the phthisical that they are not cured."

Such errors as these could only be made by writers who have never visited our shores, or by men in their enthusiasm for the land of their adoption, picturing it as the all and everything to-be-desired in the shape of climate.

It has been frequently said by many authors that the world gives us no perfect climate, and residents in Australia must endorse this view. While a great number of our summer days are most enjoyable, the strongest of us are bound to admit that when we lose the ocean climate, and the wind is blowing from the bush, north or east, with a high temperature, life is not during those days and nights the most pleasant, nor in my experience have I found such weather productive of a good appetite. Fortunately, excessive heat seldom lasts more than three or four days, being succeeded by a cool sea-breeze, which generally continues for a longer period than the hot winds, but necessitating on the part of all, careful attention to clothing. Many times have I seen the consumptive who has benefited by the long voyage break down suddenly on leaving the cool sea and coming into a temperature of from a 100° to 112° Fahr. in the shade. Such a change greatly accelerates the danger to hæmoptysis, whether it comes from the ruptured capillaries, as in the first stage, or from an ulcerated or ruptured vessel in the vomica of advanced phthisis.

Large cities should be especially avoided during the summer months, as the heat is much more overpowering, being retained in the walls of the houses and the flags of the pavement.

A glance at the following table, kindly supplied to me by Mr. Todd, the Government Astronomer, will show the temperature that must be expected in South Australia :—

TABLE OF TEMPERATURE FOR 1886.

TEMPERATURE AT ADELAIDE OBSERVATORY FOR 1886.

Month.		Max. Shade.	Min. Shade.	Max. Sun.	Lowest Max. Sun.
January	...	112·4	50·8	174·5	91·4
February	...	105·7	49·1	161·0	114·1
March	...	99·3	48·0	152·7	128·8
April	...	94·4	44·6	149·9	66·5
May	...	73·5	37·7	131·1	105·4
June	...	68·3	35·6	124·3	69·2
July	...	69·0	36·6	121·5	66·0
August	...	73·1	38·6	128·1	63·0
September	...	82·5	40·1	141·2	71·8
October	...	79·3	39·5	135·8	98·4
November	...	99·1	46·5	156·3	110·8
December	...	102·3	46·9	155·1	126·7

C. TODD, Government Astronomer.

Observatory, Adelaide, May 9, 1887.

Our average rainfall for 35 years, as compared with Melbourne and Sydney, is as follows:—Adelaide, 21·36; Melbourne, 27·23; Sydney, 49·947.

The great dryness of the South Australian climate is a point in its favour as a residence for the consumptive.

Mr. Charles Roberts, writing in the *British Medical Journal*, advocates the study of climates by phænological observations, and gives the following three groups:—

The first, indicating a hot, arid, sandy, or rocky soil, and a dry sunny atmosphere like those of the south-east coast of Spain, Upper Egypt, and the borders of the African Desert.

The second, a colder and damper climate, as of Southern Italy, and

The third, the still damper climates of the Italian lakes, the west coast of France, Spain, Portugal, and the south of England.

First group consists of the carob or locust bean (*Ceratoma siliqua*), prickly pear (*Cactus opuntus*), American aloe (*Agave Americana*), date palm (*Phœnix dactilifera*).

Second group, pomegranate (*Punica granatum*), lemon tree (*Citrus limonum*), sweet orange (*C. aurantium*), olive (*Olea Europæa*), Australian blue gum (*Eucalyptus globulus*), dwarf European palm (*Chamæropes humilis*), oleander (*Nerium oleander*).

Third group, magnolia (*M. grandiflora*), Camellia (*C. japonica*), myrtle (*Myrtus communis*), vine (*Vinus vinefera*), common fig (*Ficus carica*), Adam's Needle (*Yucca gloriosa*), almond (*Amygdalus communis*), and the horse chestnut (*Æsculus hippocastanum*).

Now, it is an interesting fact that of these three groups every tree grows in the immediate neighbourhood of Adelaide, and with the exception of the bamboo, which requires more moisture, the date palm,

whose growth is splendid, but the fruit indifferent, and the banana, which only occasionally gives fruit, all are to be found in the perfection of growth and fruit-growing powers, thus proving the climate of this portion of South Australia to be a phenological puzzle.

Experience has shown that for the early stages of consumption our dry inland country is well adapted, but in the hot summer weather, what Parkes says must be remembered:—"That the most exhausting effects of heat are felt when it is continuous day and night, especially on sandy plains, where the air is highly rarified. There is then really a decreased quantity of oxygen in a given cubic space; add to this fact that the respirations are lessened, and we have two factors at work which must diminish the ingress of oxygen and thereby lessen one of the great agents of metamorphosis."

It is at such times that the Mount Lofty Ranges—some 2,000 feet in height—Kangaroo Island, Port Lincoln, Port Victor, Port Elliot, or Edithburgh will give the traveller the Australian's crucial test of a cool night in sleeping with his blankets on.

Some writers have stated that a sea-side residence is to be avoided in this country. In my experience this does not apply to the summer months of South Australia, and it must be remembered that situations adjoining the ocean afford a true antiseptic treatment for the bacillus of phthisis. Moreover, I know of persons predisposed to and sufferers from consumption who do well as constant residents upon our coast, the sea breeze to them modifying the sometimes too irritating hot wind.

I need hardly say that it is not only useless but cruel to send out cases in the last stages of disease, and that all who come should either have private means, relations, or friends to receive them, for employment is not always easy to be had.

The ships that arrive with consumptives at the different Australian ports in summer should be so arranged as to do so in September or the early part of October, and where this is impossible, the hot season in South Australia might be spent at the places before mentioned. Kangaroo Island could be made by the ships a place of call, and arrangements made by which passengers could be taken to any of the other ports named without coming into the extreme heat at all.

Home practitioners should know that the temperature in the different Australian colonies is by no means the same at the same time of year.

It is due to the general advancement of sanitary science, and the recognition that there is no analogy between the treatment of phthisis and bronchitis, that the death-rate from consumption in

England has diminished of late years. We know that the greater portion of the 10 per cent. who have died yearly from this disease at home has been chiefly taken from the inmates of crowded houses, workshops, and towns. These facts in themselves point to a country where the greater portion of life can be spent out of doors. Such a land is that we live in. While Australians prefer to see the healthy and strong coming here, yet are they ever ready to give also a kindly welcome to those who are seekers after renewed health in a strange country.

As these colonies are the resort of so many who are phthisical, it is to be regretted that more influence is not used—from pulpit and platform at least—to prevent marriages with those who will hand down the hereditary form of this dire disease.

This paper offers nothing new to the colonial practitioner; neither does it, I think, trench on debateable ground. It is merely written as a resident doctor's contribution to this Congress, for the benefit of his fellow-workers at home.

ECHINOCOCCUS OF THE BRAIN: HYDATIDS OF THE BRAIN.

[By J. DAVIES THOMAS, M.D., F.R.C.S., L.R.C.P., Joint Lecturer on Medicine, Adelaide University; Physician, Adelaide Hospital.]

Described by the term "*Hydatids*" at least three, and possibly four, distinct cystic parasites have been known to infest man, viz.:—1. *Echinococcus*; 2. *Cysticercus cellulosæ*; 3. *Cysticercus acanthotrias*; and 4. *Cœnurus*.

All four species, it is alleged, have been met with in the human brain, and as both *Echinococcus* and *Cysticercus cellulosæ* are by no means very rare in this situation, it is very desirable that the vague term "*Hydatids*" should fall into desuetude, especially in connection with cerebral parasites.

This is of importance, not merely from the standpoint of scientific accuracy, but also on practical clinical grounds; for in some parts of Germany—*e.g.*, in Prussia and Saxony—*Cysticercus cellulosæ* is a common parasite, and it exhibits a special proclivity to attack the brain in man. For example, Dressel* found that "among the 87 cases of these bladder-worms in Berlin, 72 were in the brain."

Whilst collecting the cases upon which this paper is based, I have

* Cited by R. Leuckart, "The Parasites of Man," English translation, 1886, page 549.

repeatedly met with cases described as "Hydatids," which were evidently examples of *Cysticercus cellulosæ*.

It is curious that the only instance of *Cysticercus acanthotrias* hitherto placed on record is that observed by Weinland in America. Twelve or fifteen bladder-worms were discovered in the body of a white woman; they were, for the most part, found in the subcutaneous and intermuscular connective tissue, but one "hung freely on the inner surface of the dura mater, near the crista galli."

The occurrence of *Cœnurus* in man is denied by Davaine;* nevertheless, Clemenceaux† relates a case which certainly appears to be a genuine instance of *Cœnurus* in the brain of a woman, aged 40. This parasite infests the brain of the sheep, and causes the disease known as the "staggers" or "gid."

FREQUENCY OF THE OCCURRENCE OF ECHINOCOCCUS IN THE BRAIN.

The brain is not a common seat of this parasite in man, for out of nearly 2,000 cases of *Echinococcus*, collected from various parts of the world, "the brain, its membranes and the cranial cavity" were invaded in only a little over 4 per cent.;‡ whilst out of 800 cases treated in various hospitals in the Australasian colonies, it was found there only in nine cases, or in a little over 1 per cent. It is probable, however, that especially in private practice, in which post-mortem examinations are infrequent, the presence of the parasite in the brain is sometimes overlooked.

PROPORTION OF CEREBRAL ECHINOCOCCI TO OTHER BRAIN TUMOURS.

In England it is very rare. For example, out of 100 cases of cerebral tumour collected by Dr. Hale White§ from the post-mortem records of Guy's Hospital during the thirteen years 1872-84, both inclusive, only *once* was the growth an *Echinococcus* cyst." He naturally remarks that "Hydatid of the brain is so very unusual that it need not be considered in the group of cerebral tumours." But in Australia, where *Echinococcus* infection is so common, we cannot relegate this variety of cerebral tumour to so insignificant a position. Besides, in consequence of the vast strides recently made in the pathology and surgery of brain affections, it becomes a matter of clinical importance to increase, if possible, our knowledge of the diagnosis and possible treatment of this variety of cerebral lesion.

* "Traité des Entozoaires," Paris, 1877, pages 696 and 697.

† "Des Entozoaires du Cerveau humain," Paris Thesis, 1871, page 30.

‡ Thomas, "Hydatid Disease, with Special Reference to its Prevalence in Australia," Adelaide, 1884.

§ "Guy's Hospital Reports," vol. XLIII., 1886, page 117 and seq.

With this end in view, I endeavoured during a recent visit to Europe to collect from all the sources accessible in the library of the Royal College of Surgeons, as many as possible of the recorded cases of Echinococcus of the brain. After a careful scrutiny I have gathered and tabulated 97 cases, which appear to me to be genuine instances of this affection. In some of them the data are very scanty, but in the majority the histories are tolerably complete as far as the then current knowledge of cerebral pathology went. This, it is needless to add, was often very far indeed in arrears of the present state of the question. Still I venture to hope that some light may be thrown upon a confessedly obscure subject.

The cases have been collected into five groups, viz.:—

1. Echinococci occupying the cerebral hemispheres	...	58 cases
2. " " cerebellum	... ...	4 "
3. Multiple Echinococci situated in various parts of the brain	... ... ... ... ...	15 "
4. Miscellaneous intra-cranial Echinococci	... ...	11 "
5. Echinococci specially connected with the base of the brain	... ... ... ... ...	9 "
		97 "

With regard to groups 3 and 4, it is to be feared that but little information either in diagnosis or treatment can be obtained, but as concerns the remaining 71 cases the prospects are more hopeful.

SEX.—In 93 cases the sex of the patients is mentioned, viz.:—Males, 62, or 66·65 per cent. ; females, 31, or 33·35 per cent., so that there were exactly twice as many males as females attacked. The proportions in which the two sexes suffer from Echinococcus infection varies in different parts of the world, partly according to the relative ratio of each sex to the total population, but in a much higher degree dependent upon the chances of infection induced by the mode of life of the two sexes.

Proportion of each Sex to the Total Population.—Taking the average of the principal nations of Europe, the proportion of the sexes are, in round numbers*—Males, 48·5 per cent. ; females, 51·5 per cent. The proportion of the sexes attacked by Hydatid disease appears to vary in different parts of Europe. For example, in Iceland, according to Finsen† more than twice as many females as males (2·27 to 1) are the subject of Hydatid disease. He attributes the preponderance of women attacked to their occupation in cooking and

* *Vide* Mulhall, "Dictionary of Statistics," 1884, page 404.

† *Vide* the "British and Foreign Medico-Chirurgical Review," No. XXXII., April, 1868, page 345.

in washing utensils, this rendering them more liable to swallow the ova of *Tania Echinococcus* of the dog than men are, in consequence of Icelandic dogs being permitted to lick the vessels employed in the kitchen. It is certainly not due to the mere preponderance of females in the Icelandic population, for, according to Schleisner,* "in the Icelandic population the proportion of the males to the females is as 1,000 to 1,120"—*i.e.*, males, 47·16 per cent.; females, 52·83 per cent. More recent returns—*i.e.*, those for the year 1872—show practically the same proportions of the two sexes in this country, *viz.*, males, 47·49; females, 52·51 per cent.† In Australia the case is different, for in Victoria there is a large preponderance of males among the victims of this parasite. The proportions are, however, nearly in the ratio of the two sexes to the total population.‡ But whether we consider the case of Europe or that of Australia, it is certain that males are greatly more liable to *Echinococci* in the brain than females are, and this shows itself out of all proportion to the population-ratio of the two sexes, and what is still more curious, in far greater ratio than their liability to *Echinococcus* disease in general. In this respect *Cysticercus* resembles *Echinococcus*, for Kuchenmeister, von Gräfe, and Dressel agree that whether located in the brain or elsewhere *Cysticercus* is about twice as common in males as in females. But parasites of the brain are not peculiar in this preference for the male sex; for there can be no doubt that cerebral tumours in general occur far more frequently in males. Obernier§ thinks that the proportion may in general be stated as about ten to six, and out of the 100 cases collected by Dr. Hale White from the Guy's Hospital records, 67 were males and 33 females.

AGE INCIDENCE OF ECHINOCOCCUS OF THE BRAIN.—In 79 cases the age of the patients was mentioned, *viz.*:—

From 1 to 10 years old,	15 cases, or	19·00 per cent.	
" 11 to 20 "	27 "	34·17 "	
" 21 to 30 "	22 "	27·84 "	
" 31 to 40 "	8 "	10·12 "	
" 41 to 50 "	4 "	5·07 "	
" 51 to 60 "	2 "	2·53 "	
Over 60 years old,	1 case, or	1·27 "	
	<hr/> 79	<hr/> 100·00	

* P. A. Schleisner, in the "Journal of the Statistical Society," vol. XIV., 1851.

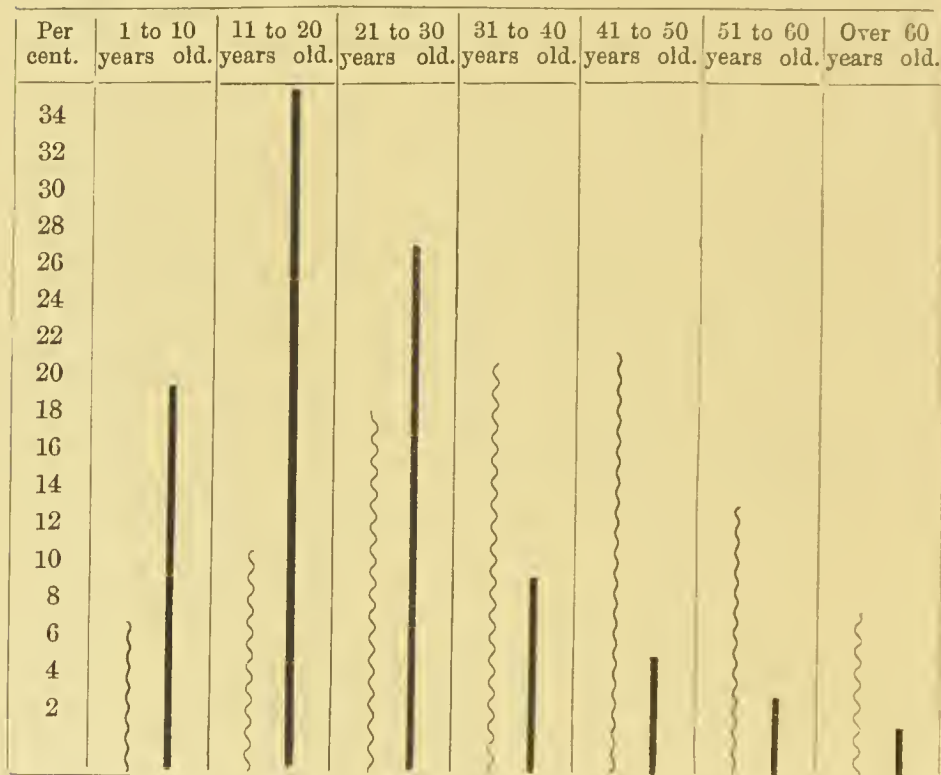
† For the figures from which these percentages have been deduced, see "Ultima Thule, or a Summer in Iceland," by Richard F. Burton, 1875.

‡ "Hydatid Disease," &c., page 151.

§ Ziemssen, "Cyclopædia of Medicine," vol. XII., page 232.

The youngest patients were a girl, aged four (Series IV., No. 7), and a boy, aged five (Series III., No. 14). In five cases the patients were seven years old. The eldest was a woman, aged 75 (Series I., No. 57). The *average age* was 21 years and 10 months. When *Echinococcus* attacks the brain, the patients die, on an average, at a much earlier age than when the parasite invades other parts of the body. From the accompanying diagram it will be seen that the highest mortality from cerebral hydatids falls in the second decade of life, whilst the maximum mortality from *Echinococcus* disease in general occurs in the fourth decade of life, at any rate in Australia.* More than 80 per cent. of the cases of cerebral hydatids die below the age of 30, while 80 per cent. of the deaths from hydatid disease in general take place between the ages of 20 and 50.

Diagram showing the distribution, according to age, of the deaths caused (wave line) by *Echinococcus* in *general* and (straight line) by *Echinococcus* of the *brain*.



THE AGE INCIDENCE OF ECHINOCOCCUS COMPARED WITH THAT OF OTHER CEREBRAL TUMOURS.—The principal cerebral tumours in point of frequency are—(1) Tubercle; (2) Glioma; (3) Sarcoma; (4)

* For further details see "Hydatid Disease," page 126.

Carcinoma. According to the statistics of Dr. Hale White, already cited, the relative frequency of occurrence is—Tubercular mass, 45 per cent.; Glioma, 24 per cent.; Sarcoma, 10 per cent.; Carcinoma, 5 per cent. The average age-incidence of these tumours varies greatly, viz.:—

Disease.			Average Age of Patients.	
Tubercle	12 $\frac{1}{2}$ years old.
Echinococcus	22 “
Glioma	32 $\frac{1}{2}$ “
Sarcoma	37 “
Carcinoma	43 “

More than half the cases of Tubercular tumour of the brain die during the first decade of life. More than half the cases of Cerebral Echinococcus die during the combined second and third decades of life. Both Sarcoma and Glioma occur with maximum frequency in the fourth decade. Carcinoma is probably most often met with after the fourth decade. Practically, then, in a case of suspected Cerebral Echinococcus, the diagnosis, other things being equal, will in a young subject principally be concerned with Tubercle; in a middle-aged or elderly one, with Glioma, Sarcoma, or Carcinoma, in the order of frequency just mentioned.

NUMBER OF CYSTS.—*Single Cysts.*—In 59 cases it is clear that there was a single mother cyst present, although many of them contained more or less numerous daughter cysts. In two instances (Series IV., No. 5, and Series V., No. 1) it is uncertain whether we have to do with a single fibrous capsule, enclosing multiple cysts, or with a mother cyst containing daughter cysts. In either case the tumour must, for clinical purposes, be regarded as a single one. *Multiple Cysts.*—In 21 cases there were multiple Echinococcus cysts, varying from two to twenty in number. Sometimes they are merely described as “very numerous.” In five instances it is stated that there was a “mass,” a “nest,” or “collection” of Hydatids.

THE SIZE OF THE CYSTS.—This varied greatly. When multiple, they were small, rarely exceeding that of a walnut, and often very much smaller. The largest single cysts were, one recorded by Rendtorf (Series I., No. 2), which weighed two and a half pounds; Yates' case (Series I., No. 31), where it was of the size of an ostrich's egg; another published by Morgan (Series I., No. 33), which contained about eighteen ounces of clear fluid, and a fourth, observed by Headington (Series I., No. 5). This contained sixteen ounces of limpid fluid. It is occasionally described as “very large” or “immense,” &c. When single they seem to range in size, generally, from that of

a hen's egg to that of an orange. The largest cysts were found in the cerebral hemispheres.

THE SHAPE OF THE CYST.—The prevalent shape is spherical or ovoid. In one instance, the tumour had a lobulated character, probably produced by the superficial veins of the brain acting as ligatures (Series I., No. 23). In some cases the cyst sent prolongations into foramina or into cavities excavated into or through the bones of the cranium.

FIBROUS CAPSULE, ADVENTITIOUS SAC.—The fibrous envelope that commonly encloses the parasite in other organs, *e.g.*, the liver, is often, indeed generally, absent in the brain, but occasionally its presence is noted—either as a fine cellular membrane or even as a well-marked fibrous capsule. In one instance (Series I., No. 47) it was thick, opaque, and calcareous. In one remarkable case (Series IV., No. 5) the parasite was enclosed in a pedunculated sac derived from the upper layer of the tentorium cerebelli. In another case, where the hydatid occupied the fourth ventricle, and invaded the under surface of the cerebellum, it was provided in the latter situation with a gelatinous capsule.

THE PRESENCE OF SCOLICES OR HOOKLETS was noted in 18 cases, so that Echinococci of the brain are by no means generally sterile.

DAUGHTER-CYSTS were found in eight instances—once to the number of 200 (Series IV., No. 5). In four other cases it is not clear whether there were daughter-cysts or multiple hydatids enclosed in a common capsule.

THE CHARACTERS OF THE FLUID CONTENTS.—In 14 cases the cyst contained clear limpid fluid; probably this also was the case in several others in which the presence of scolices was remarked. In two instances the fluid was straw-coloured, and in one other (Series IV., No. 5) it was brownish, and contained scales of cholestearin. Becquerel's case (Series I., No. 56) is peculiar, for the contents of the cyst were eight ounces of transparent, *albuminous*, somewhat *viscous* fluid, and 15 or 20 vesicles, adherent to its inner surface, contained fluid of the same kind. The chemical and physical characters of the fluid contents would raise doubts as to the real nature of the cysts, but as hydatids were also present in the lungs, the liver, and the mesentery, it was, doubtless, a genuine case of Echinococcus in the brain.

DEGENERATION OF THE PARASITE.—In three cases (Series I., Nos. 17 and 56, and Series V., No. 5) there were some indications of degeneration of the cysts, so that the *possibility* of spontaneous cure of cerebral Echinococci cannot be denied.

THE CO-EXISTENCE OF ECHINOCOCCI IN OTHER PARTS OF THE BODY.—This was remarked in eleven cases, the distribution being:—

Organ.	Number of Cases.
Liver	5
Liver and pelvis	1
Liver and left kidney	1
Liver, lungs, and mesentery	1
Liver and lungs	1
Heart and spleen	1
Heart and lung	1
	<hr/>
	11

LOCALITY OF THE CYSTS.—All parts of the brain, even the Pineal gland and the Choroid plexus, are liable to invasion, but as might have been expected from their bulk, especially the Cerebral Hemispheres. In more than half of the cases the parasite was situated in one or other hemisphere, viz.:—

In right hemisphere	30 cases
In right lateral ventricle	2 “
In the left hemisphere	19 “
In the left lateral ventricle	3 “
	<hr/>
	54 “

It is worthy of remark that the right side was involved more frequently than the left, in the ratio of three to two. The *cerebellum* was the primary seat only four times, the ratio of cerebral to cerebellar Echinococci being about fourteen to one. Apparently, the parasite is found in the cerebral hemispheres more frequently than could be expected from the relative weights of the cerebrum and cerebellum, which stand in the proportion of about eight to one.

If we compare the liability of these parts to tubercular growths we find a very different state of things, for Hale White mentions that in the 100 cases of cerebral tumours collected by him “the cerebrum was affected 22 times, the cerebellum 20 times;” so that, considering the small size of the cerebellum, it is affected with tubercular growths much oftener than would be expected. Dr. White concludes that a cerebellar tumour in a child is almost certainly a tubercular mass, and I would add, in the absence of other evidence, when the diagnosis lies between tubercle and Echinococcus in a young subject, the fact that the cerebellum is affected would be strongly in favour of tubercle as against Echinococcus.

SYMPTOMS.—In eight cases there was no history of the symptoms; in seventeen others it was very scanty. Of the remaining 72 cases a

tolerably satisfactory record exists, which in about 50 is full. In two cases the patient died of pneumonia, with no symptoms referable to the brain—(Series I., No. 4, and Series III., No. 15); in both the cysts were multiple and small. As might have been expected, the symptoms varied according to the locality and size of the cysts. The symptoms may be divided into general and special.

General Symptoms.—Headache, vomiting, vertigo, blindness and optic neuritis and atrophy, convulsions, coma.

Special Symptoms.—Paralysis (sensory or motor), implication of special nerves.

Headache.—This was by far the most frequent symptom. It was certainly present in 52 cases, and its absence is clearly remarked upon only in two cases. It, perhaps, was absent in two others. In three cases it is the only symptom mentioned, and in Gee's case (Series I., No. 36), headache of eighteen months' duration was the only brain symptom present up to the moment when the patient suddenly died. The hydatid was of the size of a turkey's egg, and occupied the middle lobe of the left hemisphere. In nearly all the cases, when present at all, the headache was the first or one of the earliest symptoms. In most cases no reference is made to the locality of the pain, but occasionally it was referred to the part of the head corresponding to the seat of the parasite. The character of the pain was usually severe and paroxysmal, and in some instances it was greatly aggravated by any movement of the head. Once trigeminal and once infra-orbital neuralgia was present.

Vomiting.—This was mentioned as present in 26 cases, and its absence was remarked upon in two instances. In one case (Series IV. No. 5) the patient suddenly died in an attack of vomiting.

Vertigo was recorded in thirteen cases.

BLINDNESS, OPTIC NEURITIS, OPTIC ATROPHY, CONTRACTION OF FIELD OF VISION, &c.

Blindness is mentioned in 36 cases. It was complete or nearly so in both eyes in nineteen cases. In two instances (Series I., Nos. 33 and 41) there was total blindness, but of the right eye only. In one case (Series I., No. 23), the patient, a boy aged fourteen, suddenly fell down senseless. Consciousness gradually returned, and it was then discovered that he was blind. In about three weeks time he recovered sufficient vision to distinguish the nurse from others round the bed. Blindness was associated with the presence of *Echinococcus* cysts in almost any part of the brain, but in cases where one eye became blind before the other, or where one eye alone became blind, the parasite occupied the side of the

brain corresponding to the blind eye or that first affected. In one case where (Series III., No. 7) there was almost complete blindness, an acephalocyst of the size of a small filbert was found in each optic tract.

Optic Neuritis, Optic Atrophy.—Optic neuritis was noted in seven cases. In two instances optic atrophy was observed. One of the cases of optic atrophy was peculiar, in that while the whole of the right optic disc showed atrophy, only the inner half of the left one was so affected. The result was amaurosis of the right eye and of the outer field of the left one. In most of the cases of blindness it is remarked that the pupils were dilated and insensible to light. In one case there was photophobia (Series III., No. 1), and in another (Series I., No. 55) there was contraction of the field of vision, &c. It is probable that impairment of vision, optic neuritis, contraction of field, &c., are present in a large proportion of cases of Echinococcus and other tumours in the brain, but that until recently the precise condition of vision has not been observed.

CONVULSIONS.—Convulsions of some kind were noted in 37 cases. In eighteen they had the characters of epileptic seizures. In one instance (Series III., No. 4) the patient was “idiotic and epileptic.” In another, the epileptic attacks were preceded by chorea, affecting principally the left side of the body, and they were followed by tetanic symptoms, trismus and opisthotonos. In this patient a large hydatid occupied each posterior lobe, and they communicated with one another through the lateral ventricles, whilst that on the right was connected with a subdural hydatid, which in turn opened through the bone into a fourth, situated outside the cranium beneath the scalp. In some cases clonic spasms of the face, arm, and leg on one side were observed (*e.g.* Series I., Nos. 30, 38, and 56, and Series V., No. 8). Once the convulsions were limited to the region of the left facial nerve (Series I., No. 46). Here the cyst occupied a part of the middle and posterior cerebral lobes on the left side, and reached to the lateral ventricle. In three cases (Series I., Nos. 30, 56, and 57) tonic spasms were present. I have been unable to trace any relation between the occurrence of epileptiform or other convulsions, and the size, number, or situation of the cysts.

The cranium was enlarged generally or locally in five cases, viz., Series I., Nos. 5, 43, and 51; Series III., No. 14; and Series V., No. 8). *The cranium was perforated* in five instances, viz., Series III., Nos. 12 and 14; Series IV., No. 8; and Series V., Nos. 8 and 9).

MOTOR PARALYSIS.—*Hemiplegia.*—More or less complete hemiplegic paralysis was noted in 27 cases. It occurred twice as often in the form of left as of right-sided paralysis, viz.:—

Left-sided hemiplegia, eighteen cases; right-sided hemiplegia, eight cases; side not mentioned, one case. In one instance (Series III., No. 6) of multiple hydatids, scattered over and inside both hemispheres, there was first temporary right hemiplegia and afterwards permanent left hemiplegia. In all the cases of hemiplegia, the parasite either occupied or invaded one or other cerebral hemisphere. But in 26 instances where *Echinococcus* cysts were found in one of the hemispheres, hemiplegia seems to have been entirely absent, and this, too, even when the parasite had attained a great size—*e.g.*, that of an orange or larger; and even in Yates's case (Series I., No. 34), where a huge hydatid of the dimensions of an ostrich's egg occupied the left hemisphere and left ventricle, the patient had only partial paralysis, for "he could grasp with his left (*sic*) hand, but its powers were manifestly impaired, and he could move his left leg about in bed, but could not stand upon it." *Paraplegia* is noted in three cases, viz. (Series I., Nos. 33 and 56, and Series IV., No. 1). In one of these cases a large hydatid occupied the right, in another the left cerebral hemisphere, and in the third the fourth ventricle.

AFFECTION OF SPEECH—APHASIA, &c.—The power of speech was affected in various ways and in varied degrees in twelve instances. In some cases there was definite aphasia. In the remarkable case of a patient of Dupuytren and Gendrin (Series V., No. 1) a prolongation of the cyst passed through the left anterior condyloid foramen, compressed and caused atrophy of the left hypoglossal nerve, with resulting complete atrophy of the left half of the tongue. In consequence the patient lost for a time the power of articulation, but by practice regained it in spite of continued unilateral atrophy of the tongue. In some of the cases it is not clear what the precise nature of the impairment of speech was.

ATAXY—"STAGGERING" OR "TOTTERING" GAIT.—In fourteen instances the gait was affected. In the majority of the cases the cysts appear to have occupied the posterior lobes of the cerebrum or the cerebellum, once the third and fourth ventricles, and in three cases were connected with the neighbourhood of the pons.

PROGNOSIS AND DURATION OF CEREBRAL ECHINOCOCCI.

Recovery from so formidable a disease as hydatid of the brain could hardly be expected to occur, and yet this was the case in two if not three instances, viz., Series IV., No. 8; and Series V., No. 9; in another instance, viz., Series V., No. 8, the ultimate result was not known. A consideration of these and other cases makes it probable that in consequence of the continually increasing advances in the localisation of cerebral lesions and their effective surgical treatment, the day is not

far distant when hydatids of the brain will become accurately diagnosed and successfully treated.

The *duration* of the disease is very uncertain, and, no doubt, very variable, according to its situation and the rapidity of its growth. In one case (Series I., No. 10) headache and vertigo had been present for five years; in another (Series I., No. 18) the symptoms seem to have existed for four years. On the other hand, in Hankins's case (Series I., No. 52) the illness was ushered in by an epileptiform fit only 27 days before the death of the patient. Probably, judging from 30 cases in which some definite data exist upon this point, the average duration of life after the appearance of the first cerebral symptom is about one year.

PHENOMENA IMMEDIATELY PRECEDING DEATH—CAUSE OF DEATH.—In 18 instances death took place *suddenly*, and often quite unexpectedly; once while the patient was trying to raise himself in bed, in another case while the patient turned in bed. Once death occurred in an attack of vomiting, and once from suffocation caused by the entrance of food into the air-passages. *Coma* preceded death in 28 cases; in one instance it lasted for five weeks before death, in another for four weeks. In 11 cases death took place during *convulsions*. Twice in a "fit," once with tetanic symptoms. In two death occurred "quietly," delirium twice, exhaustion once. In several instances death was due to other diseases, viz., pneumonia twice, pleurisy once, Bright's disease once, erysipelas once, small-pox once.

SERIES I.

ECHINOCOCCI OF THE CEREBRAL HEMISPHERE.

1. REFERENCE.—Morrish, per Dr. J. Yelloly, in the "Medico-Chirurgical Transactions," vol. II., p. 260 (1813).

Sex and Age.—Female, 19.

Locality.—Hydatid about three inches long by two inches in breadth, embedded in the substance of the right cerebral hemisphere. It projected from the upper surface of the brain, and "to its upper surface a portion of the brain was so firmly attached by the pressure it sustained against the cranium from the increase of the hydatid, that I did not venture to attempt to separate them, &c." Pia mater injected and elevated by the tumour.

Symptoms.—Headache; vertigo increased by movement, and especially by stooping; repeated fits, during which she had not convulsions, but "apparently merely loss of consciousness." Subsequently nearly complete deafness; loss of sight, first in the right eye, and then in the left; loss of smell, of power of speech, and deglutition much impaired. Later on, left hemiplegia; apoplectic stupor, from which she partially recovered, but soon relapsed and died.

Duration of Illness.—Headache, three years. Fits, eight months.

Mode of Death.—Coma.

Remarks.—No further details supplied.

2. REFERENCE.—Rendtorf, "Dissert de Hydat, in corpore humano," Berlin, 1822. Cited by Breinscr, Livois, Davaine, &c.
Sex and Age.—Female, 8.
Locality.—An enormous mass of hydatids in the right lateral ventricle. Right hemisphere one third larger than the left. Head enormous; cranium thin. Weight of sac and contents, two-and-a-half pounds (German).
Symptoms.—Rheumatic pains in the limbs. Intelligence impaired; vomiting; epileptic attacks; paralysis of left side; blindness; loss of smell; death.
Duration of Illness.—About seven months.
Mode of Death.—Convulsions.
Remarks.—Echinococci in the cysts. Evident mother cyst.
3. REFERENCE.—Martinet, "Revue Médicale" (1824).
Sex and Age.—Male, adult.
Locality.—Hydatid of the size of a hen's egg, in the posterior lobe of the right hemisphere.
Symptoms.—Frequent headache; vertigo.
Mode of Death.—Sudden.
4. REFERENCE.—Tonnellé, "Cas d'hydatides du cerveau, avec lombrics dans le foie" (1829).
Sex and Age.—Male, young.
Locality.—In the anterior lobe of the right hemisphere, at its middle, two acephalocystic hydatids, each of the size of a large nut.
Symptoms.—None referable to the hydatids.
Mode of Death.—Pneumonia.
Remarks.—Lumbrici in the small intestine and in a cavity in the liver.
5. REFERENCE.—Headington, cited by Abercrombie, "Pathological and Practical Researches on Diseases of the Brain," second edition, p. 436, (1829).
Sex and Age.—Male, 11.
Locality.—Immense hydatid in left lateral ventricle. "It contained about sixteen ounces of limpid fluid, and besides this there were several ounces in the proper cavity of the ventricle." The cyst had nearly advanced to the circumference of the brain at the middle lobe, where the membranes were adherent to the brain.
Symptoms.—Sudden attack of dimness of vision, amounting to blindness; this passed off in a few minutes. The sight became gradually impaired, so as to be nearly lost at the end of a year; then an affection resembling chorca; after a short time an attack in which he was speechless for three days; then right hemiplegia; head enlarged; temporary loss of speech; intellect unimpaired; coma.
Duration of Illness.—Two years. Hemiplegia one year.
Mode of Death.—Coma for five weeks.
6. REFERENCE.—Abercrombie, op. cit.
Sex and Age.—Female, ?
Locality.—Hydatid three inches long by two wide, in the right hemisphere.
Symptoms.—Dysphagia; loss of sight, of smell, of hearing, of power of speech; headache; vertigo; coma.
Duration of Illness.—Nine months.
Mode of Death.—Apoplexy; coma.
7. REFERENCE.—Guérard, "Bull. Soc. Anat." (1835).
Sex and Age.—? ?

Locality.—Hydatid of the size of a hen's egg, in the centre of the middle lobe of the brain, projecting externally and into the lateral ventricle.

Symptoms.—Incomplete hemiplegia, on side opposite to cerebral lesion.

Remarks.—Side of brain affected, not mentioned.

8. REFERENCE.—Chomel, "Gaz. des Hôpitaux" (1836).

Sex and Age.—Female, 25.

Locality.—Two hydatids in the right cerebral hemisphere.

Symptoms.—Violent headache. Ten days later, numbness of left leg. Six weeks afterwards, paralysis of left arm. Left hemiplegia. Right pupil dilated, and vision enfeebled. Irregular epileptiform attacks. Coma.

Duration of Illness.—About eleven months.

Mode of Death.—Coma.

9. REFERENCE.—Carrère, "Diet. de Médecine, de Chirurgie, et d' Hygiène Vétérinaire" (1839).

Sex and Age.—Male, 24.

Locality.—Hydatid of the size of a turkey's egg, in the posterior and lateral part of the right hemisphere, below the lateral ventricle.

Symptoms.—Headache for four years; dimness of vision; tottering gait; constant agitation of the head; fixed stare; hebetude; delirium requiring use of straight-jacket.

Mode of Death.—Delirium.

10. REFERENCE.—Arndt, in "Madelung, Beiträge zur Lehre von der Echinococcuskrankheit" (1841 ?).

Sex and Age.—Male, 36.

Locality.—In the anterior part of the right cerebral hemisphere, a ruptured echinococcus cyst of the size of a pigeon's egg. The cavity was filled with clear fluid and a juvenile brood.

Symptoms.—Headache and vertigo for five years. Epileptiform convulsions one year.

Duration of Illness.—Five years.

Mode of Death.—Sudden.

11. REFERENCE.—Sturton, in "Canstatt's Jahresbericht" (1842).

Sex and Age.—Male, 19.

Locality.—Hydatid in left cerebral hemisphere; partial atrophy of posterior and median lobes. The brain had lost one-fifth of its bulk. Serosity in the left ventricle.

Symptoms.—Headache for a month.

Duration of Illness.—One month.

Mode of Death.—Sudden.

12. REFERENCE.—Milcent, "Bull. de la Société Anatom" (1843).

Sex and Age.—Male, (?).

Locality.—Hydatid cyst between two convolutions near the upper face of the hemisphere. Near it, traces of an old small pouch. Meningitis.

Symptoms.—The patient was an epileptic, who died in an attack six hours after admission into Hospital.

Remarks.—No details; an exhibit.

13. REFERENCE.—Blache, "Bull. Gen. de Therap." (1847).

Sex and Age.—Male, 34.

Locality.—Hydatid of the size of a walnut, on the convexity of the left hemisphere, between the membranes of the surface of the brain, which was healthy throughout.

Symptoms.—Epileptic attacks since the age of five. These increased in frequency and duration, for the last three months recurring several times daily, at the last almost continuous. Coma.
Duration of Illness.—Twenty-nine years.
Mode of Death.—Coma.

14. REFERENCE.—Berncastle, "Lancet" (1846).

Sex and Age.—Male, 10.

Locality.—Hydatid cyst of the size of a large orange, entirely filling up the left posterior lobe of the brain, and "passing out at the inferior portion" of this lobe. Brain congested.

Symptoms.—Headache; amblyopia ending in amaurosis; excruciating pain at back of the head; emaciation. Intellect clear.

Duration of Illness.—One year.

Mode of Death.—Fit.

Remarks.—Contained transparent fluid.

15. REFERENCE.—Barth, "Bull. de la Soc. Anat. de Paris" (1852).

Sex and Age.—Female, 25.

Locality.—Hydatid enclosed in a cavity of the size of a small apple, situated in the left hemisphere above the lateral ventricle, but not connected with it. Convolutions flattened.

Symptoms.—Admitted into hospital in the eighth month of her fourth pregnancy. For four months paralysis of right arm; speech altered; face discoloured; sensibility and movement much diminished on the right side, less on the left; had suffered from headaches on the left side; drowsy on admission. Patient died suddenly near the end of her pregnancy. Caesarian section; removal of a dead fetus.

Mode of Death.—Sudden.

Remarks.—No capsule; no Echinococci found.

16. REFERENCE.—Gregory, "Observations on Intra-Cranial Hydatids." "Med. Times" (1848-49).

Sex and Age.—Male (?).

Locality.—Hydatids in the lateral ventricles of the brain.

Symptoms.—Headache; impairment of sight and hearing; convulsions, in one of which he died.

Mode of Death.—Convulsions.

17. REFERENCE.—Rigden, "Provincial Medical and Surgical Journal" (1852).

Sex and Age.—Male, 7.

Locality.—The sac, which contained numerous hydatids, occupied the middle and greater part of the anterior portion of the right hemisphere. Convolutions generally were slightly flattened, but more so over the middle of the right hemisphere. Right corpus striatum and optic thalamus extensively damaged. Skull thin, and at its upper part almost diaphanous.

Symptoms.—Admitted with paralysis of the left arm, which resembled paralysis caused by lead. He was able with difficulty to raise the arm to the head. Sensation not impaired. No headache at this time. Repeated epileptic convulsions followed, and continued until death.

Mode of Death.—Convulsions.

Remarks.—Thirty hydatids in various stages of development and decay.

18. REFERENCE.—Faton, "Bull. Soc. Anat. de Paris" (1848).

Sex and Age.—Male, 11.

Locality.—A cyst of the size of the fist, enclosing numerous acephalocysts, situated in the upper and external part of the right hemisphere.

It had involved the corpus callosum, the optic thalamus, the fornix, and the septum lucidum. Abundant effusion of serosity in the ventricles and about the brain.

Symptoms.—Severe paroxysmal right-sided headaches. Repeated vomiting. Progressive weakening of the left limbs for two years. About one year later headache returned with increased violence. Intelligence lost as well as the power of articulation. Power of speech returned in about two months, when loss of vision came on. Partial recovery of sight in the left eye occurred in about two months. Upon admission into hospital, intelligence clear; almost complete blindness; pupils dilated; divergent strabismus on the left; distortion of mouth; lowering of left commissure of lips; tongue deviated to right. Increased cutaneous sensibility of left arm and leg, with muscular weakness of same parts. Involuntary urination and defaecation. Vomiting; loss of consciousness; convulsions.

Duration of Illness.—Four years.

Mode of Death.—Coma.

Remarks.—Numerous cysts. Daughter cysts(?)

19. REFERENCE.—Charcot and Davaine, "Traité des Entozoaires," second edition, p. 704.

Sex and Age.—Male, 37.

Locality.—A large spheroidal cyst occupying the middle and posterior lobes of the right hemisphere. Apparently it was excavated exclusively in the cerebral substance, so that externally only two mm. of brain substance was left. Below it pushed downwards the roof of the left lateral ventricle, which it did not perforate. Right optic thalamus and corpus striatum slightly compressed and pushed towards the median line.

Symptoms.—For a month before admission, intelligence and memory impaired; right arm enfeebled; headache. Upon admission, marked habitude; vomiting; slow pulse, 40 per minute; complete paralysis of right arm, very incomplete of right leg, so that patient could walk with much stumbling; no loss of sensation; paralysis slowly progressive, until it became complete right hemiplegia.

Duration of Illness.—About six weeks.

Mode of Death.—Sudden.

Remarks.—A fine cellular membrane lined the cavity, and enclosed three perfectly spherical hydatids, the largest of the size of a hen's egg, the smallest of a pigeon's egg; two hydatid cysts in the heart and eight or ten in the spleen.

20. REFERENCE.—Rodust, Schmidt's "Jahrbücher" (1862).

Sex and Age.—Male, 9.

Locality.—Hydatid of the size of the fist in right anterior cerebral lobe, which had compressed the brain above and below, so as to cause its disappearance at these parts. Apparently originated in anterior cornu of right lateral ventricle. Left anterior cerebral lobe considerably excavated by the cyst; optic thalamus and corpus striatum pressed laterally and downwards; corpus callosum and third ventricle pushed backwards; corpus callosum and fornix much softened; red softening of corpora quadrigemina.

Symptoms.—No history.

Remarks.—Nurse-production; scolices; clear watery fluid.

21. REFERENCE.—Risdon Bennett, "Trans. of Path. So.," vol. XIII., p. 5 (1862).

Sex and Age.—Female, 13.

Locality.—Two hydatid cysts occupying the middle and posterior lobes of the right cerebral hemisphere. One was of the size of a large lemon. Rest of brain healthy; dura mater slightly thickened in places; right optic nerve smaller than left one. "Of the optic tracts, on the contrary, the left was decidedly the less." Posterior fontanelle open.

Symptoms.—Headache, principally at vertex; fits; sight impaired; pupils dilated and fixed; no vomiting; intelligence, appetite, and nutrition good on admission; occasional epileptic paroxysms; after a time inco-ordination of legs; slight temporary paralysis of left side of face; afterwards loss of control over sphincters; convulsions; drowsiness.

Duration of Illness.—About one year.

Mode of Death.—Prolonged convulsions.

Remarks.—Striated membrane; clear fluid contents; echinococci and hooklets; seven or eight hydatids in the liver.

22. REFERENCE.—Dr. John W. Ogle, "Brit. and Foreign Medico-Chir. Review" (1865).

Sex and Age.—Female, 26.

Locality.—Hydatid cyst of the size of a large orange, occupying the anterior lobe of the right cerebral hemisphere.

Symptoms.—"Quite well until three weeks before death, when convulsive attacks came on. She preserved her mental faculties, and was free from paralysis of any kind until the last two weeks of life, when she experienced considerable but not complete loss of vision. She also throughout suffered much from vomiting."

Duration of Illness.—Three weeks.

Remarks.—Striated membrane.

23. REFERENCE.—Barker, "Transactions of Pathol. Society," vol. X., p. 6 (1858).

Sex and Age.—Male, 14.

Locality.—Hydatid size of a medium-sized orange, occupying the posterior lobe of the right cerebral hemisphere. "It had rendered the lobe irregular and lobulated, and increased its dimensions, but the hydatid was covered everywhere by brain substance, although in many places it was a mere film. The lobulated character seemed to have been produced by the superficial veins acting as ligatures." Convolutions of brain flattened; sulci obliterated; calvaria thinned by pressure of convolutions so as to be transparent in numerous places.

Symptoms.—Suddenly fell down senseless; consciousness gradually returned, and it was then discovered that he was quite blind; headache; pupils moderately dilated and insensible; total blindness of right eye; almost complete also on left side; some improvement in vision of left eye.

Duration of Illness.—About four weeks.

Mode of Death.—Delirium.

Remarks.—The cyst was single, about as large as a middling-sized orange, and contained two hydatids, one nearly as large as the cyst itself, the other the size of a walnut; they contained no secondary cysts." Tubercles at apices of lungs; hydatid of the size of the fist in the liver.

24. REFERENCE.—Duffin, "British Medical Journal" (1865), vol. II., p. 467.

Sex and Age.—Female, 10.

Locality.—Hydatid about the size and shape of an orange, in the right anterior lobe of the cerebrum; externally the brain substance only $\frac{1}{4}$ to $\frac{1}{2}$ inch thick; convolutions obliterated; optic chiasma and optic nerves flattened by the pressure of the sac, and their nerve-fibres degenerated.

Symptoms.—Headache; blindness at first of right eye; pupils dilated; insensible to light; vomiting.

Mode of Death.—"Quiet."

Remarks.—Tubercle in apex of right lung; hypertrophy of left ventricle of heart.

25. REFERENCE.—Flood, "Indian Medical Gazetto" (1866), vol. I., p. 153.

Sex and Age.—Male, 24.

Locality.—Near the middle of the left hemisphere, somewhat inferiorly and posteriorly. "Ono large hydatid tumour was found floating in a quantity of straw-coloured fluid, in which was the ruptured sac of a second. The tumour was about the size of a hen's egg. Seven ounces of fluid were removed, and a largo cavity with uneven walls exposed; it extended full an inch and a half into the substance of the brain."

Symptoms.—Severe burning headache, referred to the crown of the head; pupils dilated; general and violent convulsions; mental faculties unimpaired to the last.

Mode of Death.—Convulsion.

26. REFERENCE.—Atkinson. "Aust. Med. Jour.," p. 290 (1867).

Sex and Age.—Female, 10.

Locality.—"A large cyst, single, and holding about half a pint of fluid, occupying nearly the whole of one hemisphere."

Symptoms.—"Epileptiform convulsions, recurring two or three times. There was no great peculiarity remarkable in these attacks."

Mode of Death.—Sudden.

27. REFERENCE.—Rasmussen, cited in "Brit. and Foreign Medico-Chir Review," p. 425 (Oct., 1867).

Sex and Age.—Male, 34.

Locality.—Hydatid rather larger than a duck's egg. Involved the second and third frontal convolutions on the left side.

Symptoms.—Numbness in right arm, and soon afterwards in right leg. Five or six months later violent headache at vertex. Memory impaired. Speech indistinct. Slight facial paralysis on right side. Tongue deviated to right, uvula to left. Complained of dysphagia.

Duration of Illness.—About ten months.

Mode of Death.—Coma.

Remarks.—Scolices abundant. No daughter cysts.

28. REFERENCE.—Parrot. "Archives de Phys. normal et pathol," tome I., p. 450 (1868).

Sex and Age.—Female, 7½.

Locality.—In the centre of the left occipital lobe, a hydatid weighing 440 grammes, and 41 centimeters in diameter. Convolutions greatly flattened, especially at posterior part of left hemisphere. The grey commissure, the corpus striatum, and optic thalamus on the left were pushed forwards. The pons, bulb, and cerebellum were pressed upon.

Symptoms.—Headache, drowsiness, vomiting, attacks of epilepsy.

Mode of Death.—Coma.

Remarks.—Echinococci present. Well marked fibrous capsule.

29. REFERENCE.—Magnan. "Comptes rendus et Mem. lus à la Société de Biologie" (1868).

Sex and Age.—Female, ?

Locality.—A voluminous cyst occupying almost all the frontal lobe (on the right side (?))—J.D.T.).

Symptoms.—For 20 months violent headaches. Six months afterwards intelligence impaired; then vomiting, dysphagia, incontinence of

faeces, retention of urine. For five months incomplete left hemiplegia; towards the end dyspnoea. For some time impairment of vision, at first on the right, and then on the left side.

Remarks.—Hooklets of Echinococci found.

30. REFERENCE.—Bettelheim (1868), cited by Wolff, "Vier Fälle von Echinococcus hominis," &c., Inaug. Dissert., Breslau (1869).

Sex and Age.—Male, 13.

Locality.—Hydatid cyst of the size of an apple, situated in the left anterior cerebral lobe, externally to the ventricle. The cortex of the cerebrum at its lateral aspect had been perforated by the cyst.

Symptoms.—A fall of about nine feet, striking the left side of the head, was followed by temporary loss of consciousness and headache; shortly afterwards loss of vision and of memory; exophthalmos; nystagmus, severe headache, principally frontal; slight paralysis of right arm; vomiting, tonic spasms of muscles at back of neck; clonic contractions of muscles of face, arm, and leg on right side; increasing paralysis while signs of irritation decreased. Coma.

Mode of Death.—Coma.

Remarks.—Well-developed capsule; clear fluid contents; numerous scolices.

31. REFERENCE.—Visconti, "Ann. Univers di Medic" (1869).

Sex and Age.—Male, 18.

Locality.—An echinococcus cyst, five centimeters in diameter, in the right posterior cerebral lobe.

Symptoms.—Long continued right-sided trigeminal neuralgia.

Remarks.—Numerous scolices.

32. REFERENCE.—Wolff "Vier Fälle von Echinococcus hominis," &c. Inaugural Dissert., Breslau (1869).

Sex and Age.—Male, middle-aged.

Locality.—Hydatid cyst, five centimeters in length, 4·5 cmt. deep, and 4·5 wide, in the posterior part of the right cerebral hemisphere. The cyst projected from the surface of the brain at a point nearly corresponding to the right parietal eminence. Convolutions flattened; sulci nearly obliterated. The cyst lay right over the posterior cornu of the right lateral ventricle, only three or four mm of brain-substance intervening.

Symptoms.—Admitted into Hospital one week before death; scarcely sensible; staggering gait; no other marked symptoms. Was in this condition for several weeks before his death.

Mode of Death.—Sudden, while raising himself in bed.

Remarks.—Slight loose capsule; scolices and brood-capsules; no daughter cysts.

33. REFERENCE.—Morgan, "Brit. Medical Journal" (June 18, 1870).

Sex and Age.—Female, 7.

Locality.—Hydatid weighing 18½ ounces, and containing 18 ounces of clear fluid; occupied the anterior and middle lobe of the right cerebral hemisphere. Externally it projected below the dura mater, internally it reached to the lateral ventricle. A considerable portion of the corpus striatum and part of the optic thalamus were absorbed. No fluid in right lateral ventricle; about an ounce of clear serum in the left one.

Symptoms.—Ill for nine months before admission into the Manchester Royal Infirmary. Illness commenced with convulsive seizures; afterwards paralysis of the lower extremities; pupils dilated; vision impaired. No strabismus.

Duration of Illness.—One year.

Mode of Death.—Coma; four weeks' duration.

Remarks.—Echinococci and hooklets present, but apparently no fibrous capsule to the brain hydatid. Hydatids in both lungs and in liver.

34. REFERENCE.—Yates, "Medical Times and Gazette," vol. II., p. 237 (1870).

Sex and Age.—Male, 27.

Locality.—Hydatid of the size of an ostrich's egg in the left hemisphere. It was seen "lying without any other than certain curd-like and perhaps inflammatory attachments within the ventricle, if such it could now be called, the floor of which was entire, while the substance of the brain above had been absorbed by the growing cyst."

Symptoms.—Severe headache; slight delirium; occasional discharge of fetid matter from the nostrils; some ataxia of gait. Later on partial left hemiplegia. (There is probably some mistake in the report of this case, for the hydatid is said to have occupied the *left* hemisphere, and yet there was *left* hemiplegia—J.D.T.) "He could grasp with his left hand, but its powers were manifestly impaired, and he could move his left leg about in bed, but could not stand upon it."

Duration of Illness.—Two years.

Mode of Death.—Sudden; apparently as well as usual; unexpected.

Remarks.—No capsule. It contained sundry echinococci (daughter-cysts (?) J.D.T.)

35. REFERENCE.—Whittell, "Lancet" Oct. 15, 1870, page 533.

Sex and Age.—Female, 13½.

Locality.—A hydatid of the size of a small orange, and which contained ten ounces of fluid, was found in the upper part of the right cerebral hemisphere. It replaced almost entirely the white substance of this hemisphere. Cranium thin; membranes thickened.

Symptoms.—Headache. A feeling as if something were moving in her head; vomiting; pyrexia; constipation; right eye blind; pupils dilated; optic neuritis; slight convulsions; consciousness perfect; paresis of left arm and leg.

Remarks.—Echinococci present.

36. REFERENCE.—Gee, "St. Barth. Hosp. Reports" (1871), vol. VII., p. 146.

Sex and Age.—Male, 19.

Locality.—Hydatid of the size of a turkey's egg, in the middle lobe of the left cerebral hemisphere; upper surface of ventricle adherent to lower.

Symptoms.—Headache for eighteen months before death; not any blindness, or other symptoms of cerebral disease.

Duration of Illness.—Eighteen months.

Mode of Death.—Sudden and unexpected.

Remarks.—A sort of capsule was present.

37. REFERENCE.—Reeb, "Observations d'Acephalocystes du Cervcau, Rec. de Mem. de Med. Militaire" (1871).

Sex and Age.—Male, 18.

Locality.—The entire right hemisphere was destroyed by a large cyst, filled with acephalocysts.

Symptoms.—Intra-orbital neuralgia radiating to the frontal region on the right side; vomiting; hemiplegia, soon followed by coma.

Mode of Death.—Coma.

38. REFERENCE.—Piazza, "Gazetta Clinica della Spedale civiso di Palermo" (1872).

Sex and Age.—Male, 28.

Locality.—A globular, transparent hydatid cyst, in the left cerebral hemisphere, near the fissure of Rolando; five centimeters in diameter, and extended nine centimeters deep; left hemisphere greatly enlarged and bulged; convolutions flattened as far as posterior lobe; dura mater thickened and opaque.

Symptoms.—Severe left-sided headache; later on, giddiness, buzzing in the ears, and drowsiness; convulsive tremor of right arm and leg; mental and general depression.

Duration of Illness.—Several months.

Mode of Death.—Convulsion.

Remarks.—Scolices present.

39. REFERENCE.—Mareks, "Ueber Echinococcus im Gehirn, Inaug. Dissert. Halle" (1872).

Sex and Age.—Male, 40.

Locality.—A round hydatid cyst of the size of the fist, filled with clear fluid, was found in the left cerebral hemisphere; it projected on the surface of the outer surface of the left temporal lobe; right half of pons much flattened; adjacent brain-substance somewhat softened.

Symptoms.—Two attacks of giddiness; right-sided facial paralysis; complete paralysis of right arm, incomplete of right leg; sensibility of whole right side of body reduced; aphasia; drowsiness; incontinence of urine; death.

Mode of Death.—Coma.

40. REFERENCE.—Bristowe, "Path. Soc. Trans.," vol. XXIV., p. 9 (1872).

Sex and Age.—Female, 17.

Locality.—A nearly globular cyst, about two inches in diameter, was found, partly in the anterior, partly in the middle lobe of the left cerebral hemisphere. It seemed to have originated between the corpus striatum and the convolutions of the island of Reil; the convolutions on the surface of the left hemisphere were flattened; the falx was displaced half an inch to the right; optic chiasma somewhat tilted; third ventricle distended with fluid, and its walls protruded downwards, so that the left third nerve, and possibly also the sixth, were a little displaced by it, but were themselves quite healthy.

Symptoms.—Constant and severe headache; occasional vomiting, and double vision. On admission was perfectly rational; no paralysis of limbs, but right side of face weaker than left; tongue deviated to right; pupils dilated, the right one more than the left. "She could see perfectly with both eyes, and could see all objects single at which she looked with both eyes, excepting such as were to the left of the median line, these she saw double." Optic neuritis in each eye; later on, epileptic fit; slight ptosis of left eye; increased double vision.

Duration of Disease.—About twelve weeks.

Mode of Death.—Sudden; severe convulsion, followed by coma.

41. REFERENCE.—Kotsonopulos, "Archiv. für path. Anat. und Physiol." (1873).

Sex and Age.—Male, 14.

Locality.—The entire right cerebral hemisphere was converted into a great cyst. The cavity contained, besides a moderate quantity of fluid (serum), a hydatid of the size of a goose's egg. The interior of the cyst was softened, and a recognition of individual parts of the brain was impossible; convolutions of right hemisphere flattened.

Symptoms.—For a year and a half, left-sided hemiplegia, which commenced in the left arm, and gradually affected all the left side; head inclined to left shoulder; sensation not impaired; headache severe

from the beginning; hearing and vision on right side defective; right pupil dilated; mind clear; paralysis increased; pyrexia; speech impaired, and then lost; contractions in paralysed limbs. Convulsions and coma.

Duration of Disease.—Two years.

Mode of Death.—Coma.

Remarks.—Echinococci found in the cyst.

42. REFERENCE.—Stocks; an exhibit at the Manchester Medical Society. "Brit. Med. Jour." (Jan. 24, 1874).

Sex and Age.—Male, 22.

Locality.—Hydatid cyst in the left lateral ventricle; convolutions of left hemisphere obliterated. The hydatid displaced five ounces of water, and had produced an opening through the brain-substance into the longitudinal fissure.

Symptoms.—A severe blow on the head three months before death. Intense shooting pain in head, giddiness; irritability of temper; occasional tremors, as if he had some "terror on him;" pupils slightly dilated; diplopia; loss of memory; no convulsions. Conversed rationally two hours before death.

Mode of Death.—Quietly from coma.

43. REFERENCE.—Verco. Unpublished case in the Adelaide Hospital (1883).

Sex and Age.—Male, 12.

Locality.—Hydatid cyst about four inches in diameter, located in the right frontal lobe; it sprang principally from the right lateral ventricle, and projected through the fissure of Sylvius; coronal suture widely opened.

Symptoms.—Headache; gradual loss of sight for four months before admission into the Hospital; convulsions followed by left hemiplegia; left side of face paralysed; protrusion of os frontis; white atrophy of optic discs; intelligence retained until towards the end, when he became drowsy and apathetic; epileptiform fits; loss of smell; loss of tactile sensibility on left side; increasing deformity of head; exophthalmos; strabismus; repeated convulsions; coma; death.

Mode of Death.—Convulsions and coma.

Remarks.—No capsule.

44. REFERENCE.—Duffin, at Path. Soc. (May 6, 1873.)

Sex and Age.—(?), child.

Locality.—A cyst in the anterior lobe of the right hemisphere.

Symptoms.—Double optic neuritis. "There were no other symptoms pointing to the existence of a tumour."

Mode of Death.—Died in a fit.

Remarks.—No details.

45. REFERENCE.—Russell, "Med. Times and Gazette" (Feb. 20, 1875).

Sex and Age.—Male, 27.

Locality.—Hydatid of the size of an ordinary orange in the white matter of the left hemisphere, outside the lateral ventricle. Internally it had compressed the corpus striatum and optic thalamus; externally it had flattened the convolutions, coming actually to the surface about the middle of the hemisphere. Pons stretched laterally, but its tissue as well as that of the medulla oblongata was healthy.

Symptoms.—Confused feeling in head; difficulty in choosing his words; partial right facial paralysis; vision imperfect; paralysis of right arm and leg followed; two severe epileptic fits, with increase of paralysis; convulsive movements in right face, arm, and leg; loss of speech;

- violent headache ; stiffness of left cheek ; some difficulty in swallowing ; bedsores ; convulsions ; stupor.
Duration of Illness.—Eleven months.
Mode of Death.—Died in a convulsion.
Remarks.—No daughter cysts.
46. REFERENCE.—Cicimara, "Contribuzione alla casuistica dei tumori cerebrali i cisti da Echinococco" (1875).
Sex and Age.—Male, 9.
Locality.—In the left cerebral hemisphere was found a hydatid cyst of the size of the fist ; it occupied a part of the middle and posterior lobes, and reached to the lateral ventricle.
Symptoms.—Headache ; dimness of vision ; vomiting ; giddiness ; in the course of a few weeks total blindness ; convulsions in the region of the left facial nerve.
Duration of Illness.—About ten weeks.
Mode of Death.—In convulsions.
47. REFERENCE.—Macnamara, "British Med. Jour." (Nov. 11, 1876).
Sex and Age.—Male, 37.
Locality.—"A cyst about the size and shape of a pigeon's egg was found in the substance of the left hemisphere, on the outer side of the corpus striatum." Capsule thick, opaque, and calcareous.
Symptoms.—Sudden coma ; pupils dilated ; twitchings of muscles of arms ; stiffness of both legs ; repeated epileptiform convulsions. Temp. 106·6.
Duration of Illness.—Thirty-six hours after onset of attack.
Mode of Death.—Coma.
Remarks.—No positive evidence of its parasitic nature.
48. REFERENCE.—Cobbold, "Parasites," p. 128.
Sex and Age.—Female, girl.
Locality.—Hydatid lodged in right half of cerebrum.
Symptoms.—Partial left hemiplegia.
Remarks.—Specimen in St. Bartholomew's Hospital Museum.
49. REFERENCE.—Cobbold, op. cit., p. 134.
Sex and Age.—(?)
Locality.—Hydatid two inches in diameter, lodged in the anterior horn of the left ventricle.
Remarks.—Specimen in St. Thomas' Hospital Museum.
50. REFERENCE.—Allen. Cited by Cobbold, op. cit., p. 140.
Sex and Age.—Male, 15.
Locality.—A large hydatid, about four inches in diameter, was found on the mid convexity of the right cerebral hemisphere, towards its anterior part. It abutted on the wall of the lateral ventricle.
Symptoms.—Partial left hemiplegia ; severe headache. Rapidly became insensible, and died next day.
Mode of Death.—Coma.
51. REFERENCE.—Fricke, "Zwei Fälle von Echin., intra-cranialis, Inaug. Dissert., Berlin" (1880)—(under Professor Westphal's care).
Sex and Age.—Male, 13.
Locality.—An enormous hydatid cyst occupied the right posterior cerebral lobe, which at its external part was entirely replaced by the parasite. Both crura cerebri displaced—the left one flattened. Optic chiasma softened. Left optic tract destroyed ; under it and the chiasma tuber cinereum a fluctuating collection of fluid. Corpora caudicantia wanting. Pons and medulla oblongata displaced to left. Convolutions of both hemispheres flattened. Calvarium thinned. Dura mater adherent to calvarium. Protrusion of right parietal bone.

Symptoms.—After a fall in the gymnasium, on the back of his head, felt discomfort in the head for three-quarters of an hour. Next day vomiting, afterwards headache, giddiness, tendency to fall to left. Occasional double vision; impairment of sight, first in the right and then in the left eye. On admission skull asymmetrical. Intellect clear. Marked impairment of power of smell. Paresis of left abducens oculi. Hemianopsia of left half field of vision, and defect of the upper quadrant of the right field. Double optic neuritis, followed by atrophy. Numerous white patches in both fundi, between optic disc and macula lutea. Epileptiform convulsions; temporary coma; tottering gait.

Duration of Illness.—One year and a half.

Mode of Death.—Shortly before death he felt quite well.

Remarks.—Scolices found in the cyst.

52. REFERENCE.—Hawkins, "Australasian Medical Gazette" (October 15th, 1882), p. 1.

Sex and Age.—Male, 18.

Locality.—An egg-shaped hydatid, three inches long by two inches wide, situated in the back of the right posterior lobe, from the surface of which it protruded; skull enlarged on right side; calvaria thinned; convolutions closely pressed together.

Symptoms.—Epileptic fit; later on severe occipital headache; sense of fulness about the throat; marked strabismus.

Duration of Illness.—Twenty-seven days.

Mode of Death.—Quietly turned in bed and died.

Remarks.—No fibrous capsule, but apparently scolices and small daughter cysts.

53. REFERENCE.—L. M. Politzer, cited by Steffen, "Jahrbuch für Kinderheilkunde," Band XX., Heft. I. (1883).

Sex and Age.—Female, 7.

Locality.—Hydatid occupying the greater part of the left cerebral hemisphere.

Remarks.—Hydatids also in the liver.

54. REFERENCE.—Mauthner, cited by Steffen, op. cit.

Sex and Age.—Female, 8.

Locality.—In the left cerebral hemisphere.

Remarks.—Hydatids also in the liver.

55. REFERENCE.—Steffen, loco. cit.

Sex and Age.—Female, 10.

Locality.—In the posterior half of the right cerebral hemisphere a hydatid measuring eight centimetres long by six wide; posteriorly, externally, and superiorly it was surrounded by condensed brain-substance, which generally did not exceed one centimetre in thickness; it lay on the roof of the left lateral ventricle, which it had compressed, and a very thin layer of brain-substance alone remained here; membranes vascular; gyri, especially of the right hemisphere, flattened; right hemisphere enlarged, and at its posterior half bulged against the left one; right corpus striatum and optic thalamus pressed forwards; left lateral ventricle distended with exudation.

Symptoms.—After a fall one year previously, signs of cerebral disturbance and vomiting; occasional severe headaches; pains in limbs, with feeling of numbness and visible contractions; silly conduct, and ataxic gait. On admission, moderate left-sided facial paralysis; difficult articulation; some deafness; pupils dilated; intelligence weakened; headaches; vomiting; difficulty of standing with eyes

closed; pulse slow and irregular; optic neuritis; field of vision contracted; general convulsions; contractures of the upper extremities, most marked on left side; involuntary urination; stupor; death.

Duration of Illness.—About a year.

Mode of Death.—Coma.

Remarks.—Echinococci and brood capsules present.

56. REFERENCE.—Becquerel, "Gazette Medicale," p. 406, Tome XV. (1837.)

Sex and Age.—Female, 13½.

Locality.—At the junction of the anterior with the middle third of the left hemisphere and underneath the membranes a cyst containing eight ounces of *albuminous* somewhat *viscous* transparent fluid was found. Adherent to its inner surface were 15 to 20 hydatid vesicles, containing fluid of the same kind as the parent cyst. The cavity containing the cyst was four inches long by two wide, and occupied the whole of the anterior and half of the middle lobe. The cyst might have compressed the optic chiasma.

Symptoms.—Perfect health until four months before admission; then headaches, convulsions, gradual loss of sight, failure of intellect; convulsive attacks, in which the patient cried out, and immediately convulsive movements set in, first in the arms, then contracture of the upper and lower limbs and opisthotonos; complete loss of consciousness; headache; vomiting; paralysis of lower limbs, rectum, and bladder; coma; death.

Mode of Death.—Coma.

Remarks.—Hydatid cysts in lungs, liver, and mesentery.

57. REFERENCE.—Potain, "Bull. de la Soc. Anatom" (1862).

Locality.—"On the convolutions which border posteriorly the fissure of Sylvius on the right side, on one of the convolutions of the posterior lobe, and in the right ventricle, immediately behind the posterior extremity of the optic thalamus and corpus striatum are found three small tumours of the size of the kernel of a nut; all three exactly alike."

Symptoms.—Weakness of legs for two years; progressive weakening, especially of left arm and leg; doubtful external strabismus in right eye; torticollis of head towards right side; retention of urine; involuntary defæcation; increasing prostration; no delirium.

Mode of Death.—Slight convulsion of face preceded death.

Remarks.—Two echinococci were found in one of the cysts.

58. REFERENCE.—Candy, "Indian Medical Gazette," p. 155 (1873).

Sex and Age.—Male, 23.

Locality.—Four or five distinct hydatid cysts, varying in size from a large marble to a good-sized walnut, situated in the right hemisphere of the brain, and extending into the lateral ventricles.

Symptoms.—Severe frontal headache; impairment of memory; dulness of intellect.

Mode of Death.—Died in slumber.

Remarks.—Contents of brain cysts; clear watery fluid of qr. 1,000; hydatid at apex of right lung, and small cyst (hydatid) in left ventricle of the heart.

SERIES II.

ECHINOCOCCI OF THE CEREBELLUM.

1. REFERENCE.—Bailey, "Lancet," p. 770 (1826).

Sex and Age.—Male, 24,

Locality.—A hydatid cyst projected into the fourth ventricle. It occu-

pied the left lobe of the cerebellum, was oval in shape, measured three inches long by two wide. The single cyst, upon partial evacuation of its contents, resolved itself into two others; to one of these a cluster of small cysts (varying in size from a small pea to a small bean) was attached.

Symptoms.—Drowsiness. Severe occipital pain, followed by strabismus and double vision. The slightest concussion of the body greatly aggravated the headache. Occasional rigors; no pyrexia; constipation. Defective sense of smell. Hammering and other noises in the head. The strabismus ceased as amaurosis came on.

Remarks.—Contents of the large cysts pale straw-coloured fluid, containing albumen.

2. REFERENCE.—Blin., "Bull. Soc. Anat." (1851).

Sex and Age.—Female, 33.

Locality.—A hydatid cyst of the size of a small walnut on the upper surface of the left lobe of the cerebellum.

Symptoms.—Headache for nine months. Walking difficult, but no paralysis. Buzzing in ears. Vomiting.

Mode of Death.—Sudden.

3. REFERENCE.—Evans, "British Medical Journal" (April 6, 1872); Hull Infirmary.

Sex and Age.—Male, 17.

Locality.—Protruding from the under surface of the cerebellum, on the left side, was a mass of hydatids, forming a tumour of about two inches in diameter; most of them collapsed, but some remaining full and transparent.

Symptoms.—Headache; vomiting; confusion of vision; strabismus and facial paralysis; optic neuritis; loud mitral bruit. Diagnosis of embolism. Recovered perfectly. Seven months later readmitted with headache, increased loss of sight, staggering gait.

Mode of Death.—Exhaustion.

4. REFERENCE.—Mignot, "Gazette Hebdom" (1875).

Sex and Age.—Male, 25.

Locality.—A cyst, believed to be hydatid, was found in the left lobe of the cerebellum at its posterior surface.

Symptoms.—Severe headache; torticollis; pains in limbs. A little later the gait became uncertain and staggering. Amblyopia. Frequent erections. Pains became severe and general, and rendered all movement impossible. No vomiting or defect of speech. Urination difficult.

Mode of Death.—Sudden.

SERIES III.

MULTIPLE ECHINOCOCCI, SITUATED IN VARIOUS PARTS OF THE BRAIN.

*1. REFERENCE.—Zeder; cited by Davaine, *op. cit.*, p. 697 (1800).

Sex and Age.—Female, young girl.

Locality.—A dozen vesicles of different sizes (some of the volume of a hen's egg) were contained in the third and fourth ventricles.

* The anatomical description of the hydatids in this case is so ambiguous that it appears doubtful whether the parasites were *Cœnuri* or *Echinocoeci*. However, Davaine regards the balance of evidence as in favour of the latter conjecture.

Symptoms.—Headache; vertigo; loss of memory; intolerance of light. When she attempted to stand, she knocked herself against surrounding objects.

2. REFERENCE.—Leroux; cited by Davaine, op. cit., p. 710 (1825).

Sex and Age.—Male, 25.

Locality.—A mass of hydatids of the size of a hen's egg, about the posterior lobes of the cerebrum and the cerebellum.

Symptoms.—Headache; vomiting; debility; syncope.

3. REFERENCE.—Leveille; cited by Davaine, p. 712 (1827).

Sex and Age.—Male, 27.

Locality.—Numerous hydatids in the meninges, and on the surface of the brain, in the corpus callosum, the left middle lobe, the right optic thalamus, &c.

Symptoms.—Headache.

Mode of Death.—Sudden.

4. REFERENCE.—Montansey; cited by Davaine, p. 712 (1827).

Sex and Age.—Female, (?).

Locality.—A great number of hydatids on the surface, and in the substance of the cerebrum and cerebellum; a score in the spinal marrow.

Symptoms.—Idiotic and epileptic.

5. REFERENCE.—Calmeil; cited by Davaine, p. 700 (1835).

Sex and Age.—Male, adult.

Locality.—Moderate-sized hydatids in the interval between the cerebral peduncles, in the course of the two chief cerebral fissures; on the pituitary body; the mamillary eminences; the optic chiasma; in the two fissures of Sylvius. The two lateral ventricles were filled with vesicles; others in the substance of the cerebral convolutions, between the folds of the cerebellum, &c.

Symptoms.—Great failure of intellect; headache; increasing dementia; later on, all movements slow; dejections passed involuntarily; drowsiness; febrile pulse; muscular tremors. Coma.

Mode of Death.—Coma.

6. REFERENCE.—Michea, "Gaz. Med. de Paris" (1840).

Sex and Age.—Male, 53.

Locality.—Numerous small hydatids on the surface of the hemisphere near the longitudinal fissure, and in the substance of the brain, especially on the left side and in the anterior lobes; one in each lateral ventricle; one each also in the left optic thalamus and corpus striatum, and in the corpus striatum and the annular protuberance on the right; none in the cerebellum.

Symptoms.—Five months previously, sudden loss of consciousness, with right hemiplegia, which disappeared after a bleeding from the arm. A fortnight before admission into hospital another attack of loss of consciousness, with left hemiplegia, which persisted; no headache; after another bleeding, notable return of sensation and movement in the paralysed limbs; violent delirium, requiring use of straight-jacket; epileptiform convulsions; coma.

Mode of Death.—Coma.

Remarks.—M. Michea remarks that Echinococci of the brain are often mistaken for Polyccephali, Cysticerci, and other cysts. Still, this is not a very clear case.—J.D.T.

7. REFERENCE.—Michea, loco. cit. (1840).

Sex and Age.—Male, 23.*Locality.*—On the left side, in the fissure which separates the middle from the posterior lobe, was found an acephalocyst of the size of a walnut; another of the size of a small filbert in the left optic tract; another of nearly similar volume in the right optic tract; another in the posterior lobe of the right hemisphere; smaller ones in the right lateral ventricle and the choroid plexus.*Symptoms.*—Headache, followed by an epileptiform attack; loss of memory; dimness of sight. Upon admission, drowsiness, slow and incoherent replies to questions; almost complete blindness; incontinence of urine and fæces; erysipelas.*Mode of Death.*—Erysipelas, apparently.

8. REFERENCE.—Ferrol, cited by Davaine, p. 710 (1842).

Sex and Age.—Male, 23.*Locality.*—In the left posterior cerebral lobe, and on the left side of the cerebellum, hydatids of the size of grapes.*Symptoms.*—Melancholy; headache; delirium.

9. REFERENCE.—Forget, cited by Davanie, p. 712 (1846).

Sex and Age.—Male, 24.*Locality.*—Numerous hydatids, varying in size from that of a hemp-seed to that of a filbert, adherent to the pia mater, and situated on the pons,*Symptoms.*—Epileptic attacks; headache; imbecile expression of face; deafness; dimness of vision; dilated pupils; no paralysis; gait unsteady; involuntary urination; diarrhoea.

10. REFERENCE.—Ogle, "Brit. and For. Medico-Chir. Review" (1865).

Sex and Age.—Male, 46.*Locality.*—One cyst of the size of a walnut beneath the arachnoid, about the centre of the right cerebral hemisphere; another half the size at the anterior part of the left cerebral hemisphere. Three or four similar cysts in the substance of both cerebral hemispheres.*Symptoms.*—Excepting an epileptic attack, no cerebral symptoms until the end, when convulsions came on; dropsy from cardiac disease.*Mode of Death.*—Convulsions.

11. REFERENCE.—Ogle, loco. cit.

Sex and Age.—Male, 57.*Locality.*—In the left Sylvian fissure a small collection of hydatid cysts, lying loose, varying in size from a chestnut downwards, the larger ones being shrivelled.*Symptoms.*—Signs of bladder trouble; no calculus; drowsiness; delirium; frequent pulse; dry tongue; coma.*Mode of Death.*—Coma.*Remarks.*—Abscess of kidney.

12. REFERENCE.—Atkinson, "Aus. Med. Jour.," p. 290 (1867).

Sex and Age.—Male, 19.*Locality.*—"A large collection of hydatids under the calvarium, which was extremely thinned by the pressure, and at one part about the size of a sixpence, absorbed. The daughter cysts were very numerous, and but little fluid existed. Both hemispheres were very much encroached upon, and deeply hollowed by the super-incumbent cysts."*Symptoms.*—Intense headaches; vertigo; head bent back; expression dull and stupid.*Mode of Death.*—Very sudden.

13. REFERENCE.—Foucault, "Bull. de la Soc. Anat. de Paris," p. 245 (1870).

Sex and Age.—Female, 12½.

Locality.—A cavity of the size of an orange situated between the thinned-out occipital bone and the dura mater. It was occupied by a large hydatid cyst; in front of this a second cyst flattened out and attached to the dura mater. It was of the size of a nut. The cyst pushed forwards the posterior cerebral lobes, and compressed the cerebellum and pons.

Symptoms.—For five months dorso-lumbar concavity increased, and head held backwards. For two months, vomiting; for a week, vision impaired; on admission, opisthotonos; no paralysis; severe pain in neck; pupils dilated; optic neuritis; drowsiness; coma.

Duration of Illness.—Five to six months.

Mode of Death.—Coma.

Remarks.—Numerous echinococci.

14. *REFERENCE.—Reeb, "Observations d'acephalocystes du Cerveau, Rec. de Mém. de Med. Milit." (1871).

Sex and Age.—Male, 5.

Locality.—Under the scalp was found a cyst, which was continued into the interior of the cranial cavity, through an opening situated at the parietal prominence. Inside it communicated with a second one, situated between the bone and the dura mater. This again communicated through a hole in the dura mater with a much larger one, formed at the expense of the posterior lobe of the right hemisphere. The last-named cyst communicated with the lateral and middle ventricles. Another cyst occupied the left posterior lobe, and also communicated with the lateral and middle ventricles.

Symptoms.—For four or five months before admission, chorea, attributed to a fall. On admission chorea affecting principally the left side of the body; dimness of vision; pupils dilated; optic atrophy; bulging of skull in right parietal region, where a small soft tumour appeared; epileptic seizures. Great improvement, so that she returned to her home for six weeks. Upon re-admission much worse. Fever, coma, &c., but again temporary improvement; then pyrexia, tetanic spasms of trunk and limbs; coma; epileptic attacks; external tumour punctured without material relief; trismus; opisthotonos; death.

Duration of Illness.—About 12 months.

Mode of Death.—Tetanic symptoms.

Remarks.—Contents of cysts, colourless limpid fluid, and numerous small daughter cysts. Great temporary improvement under use of iodide of potassium.

15. REFERENCE.—Espinosa, "Gaz. Hebdom. de Med. et de Chirur.," No. 17, p. 267 (1876)

Sex and Age.—Male, 28.

Locality.—A series of small hydatid cysts on the anterior part of the right frontal lobe. Other similar small cysts scattered between the convolutions; five in the right and three in the left Sylvian fissure. There were 52 in all, and they were covered by the arachnoid.

Symptoms.—No cerebral symptoms. Died of pneumonia.

Mode of Death.—Pneumonia.

Remarks.—No microscopic data.

* This case is cited by Davaine, op. cit. p. 701, as one published by Dr. Reeb (not Reeb). This is incorrect.

SERIES IV.

MISCELLANEOUS INTRA-CRANIAL ECHINOCOCCI.

1. REFERENCE.—Keber, "Medicinische Zeitung" (1841).

Sex and Age.—Female, 12.

Locality.—In the fourth ventricle, which was dilated to four times its natural size, was found a semi-transparent vesicle of the size of a walnut, filled with yellowish water. It compressed the left half of the cerebellum and of the pons, as well as the left crus cerebri. A gelatinous capsule surrounded the part of the cyst within the cerebellum.

Symptoms.—Symptoms of two and a-half years' duration; severe paroxysmal headaches; after about a year, gait uncertain; speech and vision affected; giddiness; almost complete paralysis of legs; contraction of flexors of right arm; vomiting; giddiness; headache; stupidity; complete blindness; deglutition difficult; respiration impeded; death.

Duration of Illness.—Two and a-half years.

Remarks.—In the vesicle about an ounce of yellowish fluid, but no organic structures; but the structure of the cyst and capsule suggested it to be echinococcus.

2. REFERENCE.—Dalgeish, "Lancet," p. 168 (1831).

Sex and Age.—Male, 27.

Locality.—"On opening the fourth ventricle, which was much enlarged, a hydatid presented itself, equal in size to a pigeon's egg, and containing about two drachms of fluid." Pia mater engorged; arachnoid opaque; upwards of twelve ounces of fluid in the lateral ventricles.

Symptoms.—General symptoms of fever, but pulse of fifty per minute; vomiting; severe headache.

Mode of Death.—Sudden.

3. REFERENCE.—Cazeaux, cited by Davaine, op cit., p. 711 (1833).

Sex and Age.—(?) (?)

Locality.—Hydatid cyst in choroid plexus.

Symptoms.—Considerable cerebral hæmorrhage.

4. REFERENCE.—Toynbee, "Trans. of Path. Soc.," vol. II., p. 21 (1848).

Sex and Age.—Female, 48.

Locality.—Hydatid cyst of the size of a large pea, placed on the inner surface of the squamous part of the temporal bone; it elevated the dura mater, and was partially imbedded in the bone.

Mode of Death.—Bright's disease.

5. REFERENCE.—Erasmus Wilson, "Lancet," vol. II., p. 143 (1848).

Sex and Age.—Male, 16.

Locality.—Large pedunculated sac growing from the left side of the tentorium cerebelli, and rising by the side of the falx cerebri, to within an inch of the surface of the brain, three and a-half inches long by two and a-half wide; its principal bulk was lodged in a hollow of the left hemisphere; convolutions of left hemisphere flattened.

Symptoms.—Ailing for 18 months; symptoms attributed to a blow on the head; frequent headaches; slight squint; partial blindness; frequent nausea and vomiting.

Duration of Illness.—Eighteen months.

Mode of Death.—In an attack of vomiting.

Remarks.—The sac was formed by an expansion of the superior layer of the tentorium; contents, clear fluid, and about 200 hydatids, varying in size from a millet seed to a pullet's egg.

6. REFERENCE.—Herbert Smith, "Lancet," vol. I., p. 48 (1871.).
Sex and Age.—Male, 17.
Locality.—"There was a small clear cyst, in all probability hydatid, though no microscopic examination was made, as the specimen was kept for the Museum, with a few small vessels passing over it (not on its wall) on the pineal gland. The cyst was about twice the size of the gland itself. It did not exercise any pressure on the gland itself.
Symptoms.—Brought in comatose; he gradually recovered consciousness, and moved his limbs; next day he started up in bed, and cried out with pain in the abdomen; soon afterwards he died.
Remarks.—Degenerating hydatid in bladder and rectum. Four degenerating hydatids in the liver.

7. REFERENCE.—Pullar, reported by Bullock, "Brit. Med. Journal," p. 312 (March 23, 1872).
Sex and Age.—Female, 4.
Locality.—Hydatid cyst of the size of a pigeon's egg lying on the left crns cerebri. Cyst easily separable. No inflammation or softening, but merely absorption of the portion of brain substance with which it came in contact. Congestion of the lungs, with muco-purulent matter in the bronchi.
Symptoms.—Five and a half months previously, sudden, severe shivering and headache, the latter frequently recurred afterwards; tremors of the limbs, especially of the left hand and arm; pupils dilated, equal; pyrexia (101° - 103°). Towards the end, the legs rigidly flexed on the abdomen. Pupils dilated, insensible to light; emaciation; loss of control over sphincters.
Duration of Illness.—Five and a half months.
Mode of Death.—Quietly, without convulsions.

8. REFERENCE.—Moulinie, "Gaz. des Hop." (1836), cited by Davaine, op. cit., p. 702.
Sex and Age.—Female, 15.
Locality.—The girl had a perforation of the cranium, covered by a crural cicatrix, which led to the belief that she had been trephined, but no such history could be obtained. A projection could be felt at the spot, and fluctuation occurred. A small puncture was made; pus, accompanied by about a score of small hydatids of the size of grapes, escaped. The patient left the Hospital in good health.
Symptoms.—Comatose sleep, out of which the patient could be aroused; constant severe headache; squint. After the escape of the pus and hydatids all the symptoms disappeared, and perfect recovery followed.
Remarks.—Recovery.

9. REFERENCE.—Thudichum, "Seventh Report of Medical Officer of Privy Council," p. 33 (1865).
Sex and Age.—Male, adult.
Locality.—Not recorded.
Symptoms.—"Perished from inflammation of the brain, caused by the presence of two echinococcus bladders."
Mode of Death.—Meningitis.

10. REFERENCE.—"St. Barthol. Hosp. Reports," vol. VII.
Sex and Age.—Female, (?).
Locality.—"Hydatid cyst in brain."
Symptoms.—None recorded.

11. REFERENCE.—J. Davies Thomas, "Hydatid Disease," p. 145 (India).
Sex and Age.—Male, (?).
Locality.—"Hydatid found in brain."
Symptoms.—None recorded. Patient admitted for cataract.

SERIES V.

ECHINOCOCCI SITUATED AT, OR NEAR, THE BASE OF THE BRAIN.

1. REFERENCE.—Gendrin's case, "Laneet" (1832-33), cited by Abercrombie and Davaine.

Sex and Age.—Male, 36 (taken ill at the age of 33).

Locality.—On the left side at the base of the brain a cyst of the size of a turkey's egg, containing a quantity of hydatids; it lay between the left hemisphere of the cerebellum and the upper part of the medulla oblongata, which was somewhat pushed to the right side; a kind of appendix of the cyst projected into the anterior condyloid foramen, and a second one extended into the anterior portion of the foramen lacerum posterius, where the nerves are situated; traversed this foramen, made its way under the muscles attached to the transverse processes, and formed a projecting tumour near the angle formed by the complexus and sterno-mastoid muscles; the left hypoglossal nerve, after its passage through the anterior condyloid foramen, was compressed and atrophied, even to its last branches in the tongue; the nerves passing through the left foramen lacerum posterius were compressed, and the glossopharyngeal was atrophied; the muscles of the tongue and of the velum palati on the left side were greatly atrophied; the left vocal cord was atrophied.

Symptoms.—Three years before admission into the Hôtel Dieu, violent left-sided occipital headache, extending to upper and back part of neck; * difficulty of speaking; passage of air on left side of tongue with a hissing noise; total atrophy of muscles of left side of tongue; by practice he recovered power of articulation, in spite of the continued atrophy of the left half of the tongue; hiccup; vomiting; constipation; evening pyrexia; complete aphonia; loss of memory; deglutition difficult; liquids tended to enter the larynx; intercostal muscles inactive; respiration embarrassed; abundant mucous râles in both lungs; attacks of drowsiness, lasting one to two hours; intelligence unimpaired; death.

Duration of Illness.—Three years.

Mode of Death.—Entrance of meat into the larynx, trachea, and bronchi; suffocation.

Remarks.—The hydatid cyst contained two large hydatids.

2. REFERENCE.—Guesnard, 1836; Davaine, op. cit., p. 588; also cited by Odile: "Des Kystes Hydatiques de la base du Crâne," Paris Thesis. (1884).

Sex and Age.—Male, 7.

Locality.—In the right middle fossa of the cranium was found a large cyst situated between the dura mater and the temporal and parietal bones. It was twice the size of a hen's egg, occupied the whole of the right middle fossa, projected through the sphenoidal fissure into the orbit, and penetrated into a recess in the body of the sphenoid bone. This cyst was attached to another hydatid, situated in the pituitary fossa. Both cavernous sinuses displaced. Numerous small hydatids in the substance of the body of the sphenoid bone. Right hemisphere excavated by the cyst at the base and sides of the middle lobe. Its convolutions flattened. Floor of right ventricle raised so as to touch its roof. Optic thalamus and corpus striatum slightly flattened. Optic nerves elevated by the tumour, so as to be, as it were, strangled by the upper edge of the optic foramen. The

* Followed a fall, striking back of neck.

nerves in the outer wall of the cavernous sinus compressed, especially the ophthalmic branch of the fifth.

Symptoms.—Suddenly, and without any precursory symptoms, right ptosis came on. Twelve days later, headache, rigors, vomiting. On admission, ptosis and exophthalmos on the right; pupil dilated; conjunctiva insensible to touch; blindness of left eye, but tactile and reflex irritability remained. Intelligence perfect. Slight elevation of the angle of the mouth, and of all the features on the right side. Appetite good. Was lively in his talk, and except for his double amaurosis and a slight hemiplegia, he seemed quite well, when he took scarlatina, from which, however, he had hardly recovered before he was attacked with smallpox, of which he soon died.

Mode of Death.—Smallpox.

Remarks.—Hydatid of the size of a walnut in the liver.

3. REFERENCE.—Lagout (1845), "Bull. de la Soc. Anatom" (1846), cited by Odile; "Des Kystes Hydatiques de la Base du Cranc., Paris Thesis." p. 51 (1884).

Sex and Age.—Female, 45.

Locality.—A hydatid which had developed along the right side of the medulla oblongata and pons. It extended along the fifth nerve, and had destroyed the Gasserian ganglion.

Symptoms.—Right eye altered and softened. Right nostril and right side of buccal cavity insensible. No deviation of tongue.

Mode of Death.—Coma.

4. REFERENCE.—Stewart, cited by Gregory, loco. cit.

Sex and Age.—Male, 24.

Locality.—A nest of hydatids of the size of the closed fist completely filled the middle fossa of the cranium on the left side. It lay between the dura mater and cranium. The adjacent bones were much roughened. Brain pressed to the right.

Symptoms.—Constant headache; epileptic fit, followed by coma; afterwards mental imbecility; vision impaired; slight left ptosis; staggering gait; idiotic expression of face; threatened asphyxia from blockage of œsophagus by a piece of meat; tracheotomy; repeated epileptic fits; coma.

Mode of Death.—Coma.

Remarks.—The cysts varied in size from a small pea to an orange.

5. REFERENCE.—Roger, "Gaz. des Hop.," p. 345 (1865).

Sex and Age.—Male, 13½.

Locality.—At the base of the brain, behind the optic chiasma, a cyst containing brownish fluid, in which scales of cholestearin were floating. The cyst had formed at the side of the cranium, had excavated the bone, and had compressed the optic bands, especially the left one; it entered into and distended the third ventricle, and had penetrated into the lateral ventricle (left). Another group of four or five small degenerating hydatid cysts was found at the level of the middle lobe of the brain (side not mentioned).

Symptoms.—Headache; frequent vomiting; head bent back; pain at nape of neck; general and severe convulsions; amaurosis; coma; pyrexia.

Duration of Illness.—Several years.

Mode of Death.—Coma.

Remarks.—No microscopic data, but the author regarded the cysts as degenerating hydatids.

6. REFERENCE.—Sunderland, "Lancet," vol. 1. p. 201 (1873). At the Queen's Hospital, Birmingham, under Dr. Sawyer's care.

Sex and Age.—Male, 29.

Locality.—A cyst, with thin opalescent walls lay between the anterior border of the pons behind, the optic chiasma in front, and the middle cerebral lobes laterally. Both right and left third nerves were flattened, the optic commissure pressed upon, the corpora albicantia had disappeared; the fornix was semi-diffuent. The cyst plunged into and formed part of the floor of the third ventricle, and apparently was developed in the posterior subarachnoid space.

Symptoms.—Severe pain at back of head and nape of neck for ten weeks; noises in ears; frequent vomiting; occasional staggering; deafness; loss of memory; speech difficult; hyperemia of optic discs; ataxia; constipation; coma.

Duration of Illness.—Less than three months.

Mode of Death.—Coma.

Remarks.—Large hydatid cysts in the liver and in the left kidney.

7. REFERENCE.—Kühn, "Berlin Klin. Wochenschrift," No. 41 (1883).

Sex and Age.—Male, 34.

Locality.—At the base of the brain; numerous echinococcus cysts, varying in size from that of a lentil to that of a walnut, in very abundant yellowish fluid. No erosion of brain substance; membranes thickened at the base; lateral ventricle greatly distended with fluid; brain flattened.

Symptoms.—Epileptic attacks; temporary stupor; dementia; uncertain, tottering gait; definite vertiginous movements; dimness of vision; dilated pupils; no paralysis; no affection of speech.

Mode of Death.—From pleurisy.

8. REFERENCE.—Fricke, "Zwei Fälle von Echinococcus intracranialis; Inaug. Dissert., Berlin," p. 17 (1880); Westphal's Clinique.

Sex and Age.—Male, 17.

Symptoms.—Right-sided exophthalmos; bulging of right fronto-temporal region; amaurosis of right eye; defect of outer field of left eye; motor paresis of left limbs; white atrophy of right disc, and of inner half of the left one; headache; vomiting; afterwards inflammatory swelling of the eyelids, and of frontal, temporal, and vertical regions on the right side; perforation of the bone about ten cm. above the outer angle of the right orbit; fluctuation here; incision gave exit to pus, shreds of membrane, and echinococcus-cysts: a second protrusion formed in the line of the coronal suture, incised with similar results. The two openings communicated internally; afterwards cysts were brought away by coughing and hawking, and also through the left nostril; cicatrization occurred. Great improvement followed, but in a few months time clonic spasms of the left arm, leg, and face, without loss of consciousness, but followed by temporary paralysis.

Remarks.—Ultimate result unknown.

9. REFERENCE.—Odile, "Des Kystes Hydatiques de la Base du Crâne, Paris Thesis" (1884), patient under the care of Dr. Bucquoy, in the Hôpital Cochin.

Sex and Age.—Male, 43.

Locality.—Hydatid perforating base of skull.

Symptoms.—For three years severe headaches; for two years vision and hearing impaired; for two and a-half months a tumor on left side of neck; expectoration of hydatids; left ptosis; imperfect vision on left side; paralysis of left external and inferior rectus muscles; contracture following paralysis of left side of face; anaesthesia of side of face and of the olfactory and buccal mucous membranes, all on the left side; no affection of the limbs; on the left side of the neck a tumour

half the size of the fist; it lay below the sterno-mastoid muscle, hard, resistant, not painful, hardly ever tender; it increased rapidly in size, became phlegmonous, and was incised; pus and hydatids escaped, but the patient continued to yield vesicles through the mouth and nose. About six months after admission headache and anæsthesia had disappeared, but the paralysis remained, and the wound had nearly healed; when last seen complete cicatrisation had taken place, and no more cysts had been evacuated for a long time; pyrdysis remained; sensation perfect.

Remarks.—Recovery.

ON DILATATION OF THE STOMACH, AND ITS TREATMENT BY MEANS OF WASHING OUT.

[By F. W. ELSNER, F.R.C.S.I., L. & L.M.K.Q.C.P.I., Richmond, Victoria.]

(ABSTRACT).

In this paper the author narrates a case of dilatation of the stomach which had been successfully treated by the plan of washing out the stomach, recommended by Tosswill. He considers that the operation of digital dilatation, performed by Loreto, will be justifiable in only very rare cases, and then proceeds to enumerate under 23 headings the various causes that may give rise to gastric dilatation, grouping them as external, internal, and diathetic. His patient (who was exhibited to the Section) was a man 45 years of age, of intemperate habits, whose illness commenced with hæmatemesis, followed by attacks of gastric pain so severe as to resist all ordinary treatment. The liver was found to be considerably enlarged, but no evidence of carcinoma ventriculi (the disease of which his father died) could be detected. He was given calomel, gr. iv., twice daily, and became salivated, and the writer is of opinion that the calomel formed by its own weight a kind of diverticulum in the stomach, which was now found to be enormously dilated, occupying nearly the whole of the peritoneal cavity, and displacing the thoracic viscera upwards. All the usual remedies failed to alleviate the distension and intense pain, and in the vomit, sarcina were found. The soft stomach tube was therefore used, but the first time it caused such severe pain that it could not be employed again for nearly a month; then it was passed twice daily, the stomach admitting at first as much as six quarts of fluid. The distension gradually diminished, the pain became less, the dyspnœa was relieved, and one washing a day was found to suffice. After three months the treatment was

discontinued, and medicinal remedies employed. He rapidly emaciated, and the stomach-tube had to be employed again for the relief of pain; at the same time peptonised foods were given. In about a couple of months more he was completely cured, and has remained so ever since. The writer is of opinion that the patient had "pyloric stenosis, due to alcoholic thickening, and that the stomach was weakened by amyloid degeneration, which showed itself also in the enlargement of the liver and the former albuminuria which the patient suffered from." The writer concludes by mentioning other cases in which the same treatment was adopted with success.

ON TUBERCULOSIS.

[By F. W. ELSNER, F.R.C.S.I., L. & L.M.K.Q.C.P.I., Richmond, Victoria.]

(ABSTRACT).

The author remarks that the discovery by Koch of the bacillus of tubercle has rendered clear the essential pathology of tuberculosis, and that this disease should in future occupy a recognised position in preventive State Medicine side by side with diseases similar in character, *e.g.*, typhoid fever.

"At present we know that the disease we are considering is a specific and infectious one, with a period of incubation as yet undetermined, characterised by the eruption throughout the body, or in special parts thereof only, of certain minute bodies, known from the time of Laennec as tubercles, which undergo certain pathological processes called tubercular. Wherever this tubercular process is most active, as well as in the blood under certain conditions, minute bacilli are to be found on microscopical examination."

It is especially by the sputum that tuberculosis is spread.

"Bacilli in the sputum are easily obtained by means of Ehrlich's method, and their presence or absence will enable the investigator to determine whether the process in the lung is tubercular or not, a point the significance of which in regard to State Medicine can hardly be over-estimated, for by a close observance of the rule that every suspicious case should be examined with respect to bacilli in the sputum, such terrible calamities as those described by Elsenberg recently, where a phthisical operator infected several children whom

he circumcised according to the Jewish law, may be avoided, and a phthisical individual mayhap be prevented from becoming a source of infection to his surroundings in the future."

"The phthisical sputum retains its virulence for a long time, even after it is arid, and given a suitable nidus for its reception, the bacillus it contains will produce miliary tuberculosis or local forms less acute, according to circumstances."

Tuberculosis is not hereditary, but the predisposition to such morbid changes in the lungs and tissues as afford a nidus to the bacilli is hereditary.

One of the principal points advocated by the author is "the separation of the infected from non-infected persons in every community, if not by actual isolation at first, yet by some such means as residence in a sanatorium would afford."

The utensils, clothes, bedding, and room used by a phthisical patient should be destroyed or disinfected in a manner similar to that employed when smallpox is in question.

The author points out "that tuberculosis is in a way considered to be infectious in Victoria, in so far as animals are concerned, and that a great commotion has recently been made about the sale by butchers of the meat of tuberculosed animals, and by milkmen of the milk of cows affected with tubercle."

"In regard to transmission from animals to human beings, a striking case occurred in my practice last December. A farmer from Kyneton was obliged to change his occupation and come to Melbourne. One of his children (Eilcen, *æt.* seven) was seized shortly after her arrival here with symptoms of typhoid, which was then raging, and I was called in to attend her. The symptoms, however, soon became atypical, and Dr. Hodgson, who saw the case with me, agreed that it might possibly be a case of tuberculosis, which it ultimately turned out to be, as death took place on the 21st day of illness from pulmonary complications. I followed the course I usually adopt in such cases, and elicited from the father the remarkable fact that he had killed several pigs shortly before he came to Melbourne because they looked "seedy," and that he was struck by the occurrence of bodies like millet seeds all over the peritoneum, liver, lungs, and other organs of these animals. Not knowing that these bodies might represent a diseased condition he allowed the livers of these pigs to be eaten by his family fresh, and noticed that his little girl began to droop about twelve or fourteen days afterwards.

"Secondly, in regard to infection through the mother's milk, there is this case. A woman with undoubted phthisis became pregnant and bore a child, which she nursed herself, and which died at the third

month of general tuberculosis. All her other children to the number of four are well and healthy, but she died herself of phthisis in last January, eight weeks after the death of her child. Why should this child have died of tuberculosis unless it was infected by its mother? The other children ought to have developed phthisis ere this if the theory of hereditary transmission be true. The fact of their not having done so is evidence that their mother was not capable of infecting them when she nursed them, as her disease was not sufficiently advanced; whereas the infant's rapid demise sufficiently shows the rapidity with which the disease, once well started, will terminate.

"Thirdly, to show the danger of allowing uninfected persons to mix with cases of true phthisis, may be mentioned the cases which occurred at a large wholesale druggist's establishment in Melbourne. At first there was only one man with a cough and expectoration, amongst the hands employed there. His 'mate' became ill with an affection of the lung, which he did not attach sufficient importance to, and continued at his work. He next developed catarrhal pneumonia, for which I attended him, and questioned him, when he made the remarkable statement that his 'mate' used to expectorate great quantities of yellow mucus upon the floors, and that these were allowed to dry up and get mingled with the dust, which was only removed once a day, namely, in the morning. Next I heard that one of the chief men in the establishment had been obliged to give up work, and travel, having symptoms of consumption. Then two more cases occurred, and my patient died of true tubercular phthisis. What the fate of the last two cases may be I cannot as yet say, but I believe the prognosis is bad.

"To summarise, then, the principal points which I wish to bring under the notice of this Section of the Congress are these:—(1) Two dangerous factors have to be dealt with in connection with cases of tuberculosis, or consumption, namely, the bacilli and the ptomaines. (2) Tuberculosis being contagious and infectious, should be classed as such in the Public Health Statutes. (3) Health officers should be acquainted with the methods necessary to discover bacilli in the sputum and other secretions. Laboratories should be instituted for teaching bacteriology as a part of a course of hygiene in connection with the office of Health Officer. (4) All cases of severe lung disease should be especially examined, with regard to their being tubercular or non-tubercular. Practitioners should have the assistance of the Health Officer to determine this point. (5) Persons afflicted with tubercular consumption should be removed from surroundings to which they could convey contagion, and should cer-

tainly not be allowed to hold public offices or to contract marriage once their condition has been ascertained. (6) A sanatorium for the reception of cases of this kind, as well as of other severe pulmonary and tubercular affections, is an absolute necessity for each colony. N.B.—Provision is made in Victoria for cases of leprosy, about the contagion of which we know far less than we do of tuberculosis. (7) Tubercular meat and milk ought most certainly to be kept out of the market. (8) The idea of hereditary transmission should be discouraged, since it leads to neglect of sanitary precautions. (9) The treatment offering most advantages consists in good food, fresh air (notably sea air), sea bathing, the inhalation of antiseptics, and removal of local foci of possible infection. (10) The immigration of phthisical persons seeking health ought to be deprecated as useless to themselves and dangerous to the community at large."

SOME POINTS IN THE ADMINISTRATION OF ANÆSTHETICS.

[By J. W. SPRINGTHORPE, M.A., M.D., M.R.C.P., Honorary Physician Melbourne Hospital.]

The main design of this paper is to bring forward certain variations from the established mode of administering chloroform for anæsthetic purposes. Other practical points in the administration of anæsthetics generally will also be dealt with.

It is difficult, if not impossible, to embrace in any single description, the complex sum of the phenomena of chloroform anæsthesia. Still, for the sake of clearness, it is necessary to formulate some such description, which will serve both as key to the interpretation of results, and as basis for further explanation. Such a map of the domain of chloroform anæsthesia it is taken, may be found in the following, which is largely extracted from Lauder Brunton's work on Pharmacology. Therapeutics, and Materia Medica. The results of chloroform inhalation are partly local, partly systemic. Locally, there is progressive irritation and subsequent paralysis of the nerves supplying the nose, larynx, and lung structures. Reflex stimulation from the irritation to nose and larynx, causes slowing of pulse and of respiration. As these nerves become gradually paralysed, stimulation of the branches of the vagus in the lung, produces accelerated respiration, and generally, also, quickened pulse. As these in turn are paralysed,

the influence of reflex irritation vanishes, and the respiratory centre maintains respiratory movements with a slow, steady rhythm. Meantime, however, the drug is acting systemically also, and its systemic influence may modify these results. Here, too, there is a certain order of invasion; and it is because this order is practically so invariable, that chloroform has been selected as *the* agent for removing consciousness. There is, to begin with, the stage of stimulation and of departing consciousness. The convolutions are first invaded, the reason, imagination, and senses, special and general, are exalted; there is excitement, then confusion, then blurring and blunting, with imperfect consciousness. Following this, loss of cerebral control, and, probably, with stimulation of the cerebral and spinal motor centres, there are the well-known irregular tonic movements and gesticulations. There is similarly (and during this stage), stimulation of the circulatory and respiratory centres, with quickened respiration and pulse, and raised blood pressure. A stage of depression follows, and, be it noted, practically in the same order of invasion. Consciousness first ceases with the appearance of a heavy sleep; voluntary movement follows, with abolition of sensation, special, and general; reflex excitability and muscular tone fail, respiration, heart action and blood pressure become depressed; and anæsthesia is complete. Now is the time generally considered suitable for operation. Beyond is the stage of danger; there is not only complete loss of all reflex excitability, but the respiratory centre is paralysed, the breathing becoming weaker, irregular, and sighing. The cardiac centre usually fails later, the heart ceasing in diastole, the blood pressure falls to zero, and death occurs from respiratory or cardiac failure, or both. It is taken for granted that in the administration of chloroform, the Edinburgh procedure is that which is to be commended. The essential element of safety is that not more than 5 per cent. of chloroform is inhaled. The respiration is watched, and not the pulse. The preparation of the patient, the position, and the mode of administration are such as are generally followed. It is unnecessary to cite how the successes of Syme, Lister, and others have proved the value of these safeguards, and how M. Paul Bert's experiments have verified their contention, that the main danger is from stoppage of the respiration, and not from failure of the heart.

But whilst thus thoroughly supporting their practice in the main, the writer ventures to differ upon several minor yet important points:—(1). The first is the degree of anæsthesia required in teeth extractions. The common practice in all cases, is to wait for the abolition of the conjunctival reflex, and then to operate. The danger, we are told,

is in imperfect anæsthesia, when reflex inhibition of the heart is not counterbalanced, as it is in complete anæsthesia, by reflex contraction of the vessels. Hence cardiac syncope, and death from reflex shock. Undoubtedly this is a very grave danger, and probably it is the cause of many deaths in major operations, especially in operations about the abdomen and anus, where the sympathetic system of nerves is so immediately concerned. But in slighter operations, if the patient is still in the stage of stimulation, though of imperfect consciousness, it is maintained that no such danger exists. It is only when the stage of depression has been well entered upon, that the reflex is a serious inhibitor. Till then it may be even a cardiac and respiratory excitant. This result has been arrived at from many observations and cases. It is now the writer's endeavour in administering chloroform for extractions always to keep the patient in the first stage. Sensibility is practically abolished, though reflex action remains; the teeth are extracted without any pain, though the hands may be drawn up towards the face, the legs stiffen, and even an automatic cry be given; there is little after-depression, vomiting only very rarely, if ever, occurs, and at no time is there any danger to life. It is not always possible, however, to hit upon this happy medium between unconsciousness and depression, some patients taking chloroform so insidiously or erratically. In such cases it is certainly necessary to proceed to the normal stage of conjunctival bluntness. But the results of limiting the anæsthesia to this earlier stage are so good that the writer does not hesitate to advocate the practice as well worthy of further investigation. (2). Similarly in small operations about the mouth and throat, wherein he is in the habit of administering chloroform for a specialist (mainly for the removal of post-nasal adenoid growths) the good effects of limiting the degree of narcosis to cortical anæsthesia are most marked. In addition to the advantages already claimed, the retention of the reflex movements of the throat and œsophagus, prevents the trickling of blood into the larynx and stomach. The blood is coughed up, accumulation in the stomach and subsequent sickness are averted, and trickling into the trachea never occurs. It may certainly require assistance to regulate the disorderly movements of the body which occur as the lower centres resist operative interference; and to the uninitiated eye it may seem, as if too little chloroform were being given, but both the specialist and himself are satisfied as to the value of the innovation. (3). As a further advantage in some cases, it is found well to use a mixture of chloroform, ether, and methylene, equal parts, freshly prepared. The stimulant stage is apparently prolonged, and a practical point is that the mixture may be given in a

more concentrated form than the chloroform alone. (4). Coming now to cases in which the stage of depression has to be reached before the operation begins—in major operations generally—the writer remains still an advocate for chloroform, but only after the previous use of ether by means of a Clover's inhaler; the patient being put completely under the influence of ether, and kept unconscious with a minimum quantity of chloroform. The writer is aware that Clover's latest ideas were to begin with nitrous oxide, and introduce ether gradually, without letting any fresh air in; and to end with a hypodermic of morphia when great pain was likely to follow, whilst for ordinary surgical uses he believed ether to be safer than chloroform. But along with many others, he is perfectly satisfied with chloroform, with Listerian precautions as to administration. Undoubtedly, however, the previous use of ether has been, in his experience, a valuable and additional safeguard. (5). The writer would be glad to see recorded the experience of any chloroformists upon these points, and also upon the further question of "mixed narcosis." He would ask also if "tea tasters" have been found by others, as they have by himself, to be bad subjects for chloroform.

SOME POINTS OF INTEREST IN THE PHYSIOLOGY OF ARTIFICIAL DIGESTION.

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I have been working at the subject of artificial digestion for some time past in connection with the laboratory teaching in the Melbourne University, and from time to time points have suggested themselves to me as being worthy of fuller investigation and discussion. It seemed to me that no better opportunity would offer than the present to ascertain the manner in which these questions are regarded by other workers, both exoteric and esoteric, as regards special physiology.

ARTIFICIAL PANCREATIC DIGESTION.

In the August number of the *Australian Medical Gazette* I published an account of the manner in which various artificial digestive fluids may be prepared, and pointed out that artificial pancreatic

juice must be differently prepared, according as it is wished to operate on starches or on proteids.

With respect to its action on proteids, as Mr. Kirkland points out, similar results may be obtained by adding a pancreatic juice containing a small quantity of zymine (Fairchild) to 1,000cc. of a one per cent. carbonate of soda solution, or by using a much larger quantity of zymine in 1,000cc. of a .01 per cent. carbonate of soda solution. In other words, increase in the quantity of zymine over a normal amount, and increase in the alkalinity up to one per cent. carbonate of soda produces similar effects as regards the action on proteids. But with respect to the action on starches the matter is very different. A one per cent. alkaline artificial pancreatic juice will not act on starches at all, whilst the .01 per cent. juice acts fairly efficiently; but zymine acts best on starches in a purely neutral solution. The question, then, which Mr. Kirkland suggested was, What takes place normally in the intestine where the alkalinity is usually said to be one per cent.? Is the ferment in great excess in the pancreatic juice, or are the facts wrong, and is the alkalinity really less than one per cent.

If arrowroot (or any other) starch be digested with zymine (*vide* "Proceedings Victorian Medical Society" (March, 1887), *Australian Medical Gazette* (August, 1887), a very curious result ensues. Thus, one gramme of starch made into mucilage with 50cc. of water, and maintained at a temperature of 35° to 40° C., is converted by 0.5 grammes of zymine into erythro-dextrin and glucose in a few minutes; the presence of the erythro-dextrin being indicated by the iodine test, and that of glucose by the picric acid and sulphate of copper tests. But, curiously enough, no matter how long the digestion is maintained, the relative quantities of dextrin and glucose do not appear to alter very much, so that the zymine seems to produce a given effect rapidly, and then to cease to act. The action of pancreatic juice in the intestine is usually believed to end in the conversion of the starch into glucose, the dextrin being only a temporary product. Can it be that this is due to the fact that the artificial digestion is effected in glass vessels, and not in dialysers, and that the excess of glucose stops further change, or is it due to some change in the zymine itself? This question will probably be answered when one can prepare a *selective* dialyser. However, this checking of the action is very beneficial from a clinical point of view, since the object of predigesting foods is not to totally convert them, and so *replace* the normal digestive process, but to partially digest, and so *supplement* the normal digestive process.

The newly-prepared ferment trypsin (Fairchild) of the pancreatic

juice acts with extraordinary power on proteids. Thus, 100cc. of a one per cent. solution of carbonate of soda, with 0·2, or even 0·1, grammes of trypsin, forms the most powerful digestive fluid with which I am acquainted; one grammo of washed fibrin disappears in from 15 to 20 minutes at 35° to 40° C. But, curiously, the sulphate of copper test, although it indicates the presence of peptone after the disappearance of the fibrin, does not indicate the presence of a large quantity of it, and if the action be allowed to continue very little indeed is detectable. Into what, then, is this fibrin primarily and secondarily converted, and by what means can the ultimate products be detected.

THE ACTION OF ARTIFICIAL PANCREATIC JUICE ON OILS AND FATS.

In the number of the *Australian Medical Gazette* already referred to an allusion has been made to the peculiarities in the emulsifying power of pancreatic juice, and the table which follows gives the experiments on which the conclusion is based. An examination of this table will show that apparently the emulsifying power of pancreatic juice is due to the presence of albumen, a normal constituent of the juice.

ACTION ON OILS AND FATS.

Experiments tending to prove that pancreatic juice of itself does not emulsify oils and fats (Kirkland). The emulsification is due to the albumen present.

1. Place in test-tube 5cc. p. juice, which, after three hours. digestion, has converted all albumen into peptone; add 5·5cc. of oil. Shake well. No permanent emulsion. Solution becomes acid in 24 hours or more.
2. Place in test-tube 5cc H₂O + 2·5cc. oil. Shake well. No permanent emulsion.
3. Place in test-tube 5cc., 1 % Na₂CO₃ + 2·5cc. oil, and shake well. Emulsion is more permanent than 2.
4. Place in test-tube 2·5cc., diluted albumen (1-10) + 2·5cc. oil + 2·5cc. H₂O. Shake. A permanent emulsion is formed. Solution does not become acid on standing.
5. Place in test-tube 2·5 diluted albumen + 2·5cc. p. juice + 2·5cc. oil. Shake. A permanent emulsion is formed, which becomes acid after 24 hours.
6. Place in test-tube 2·5cc. diluted albumen 2·5cc. p. juice; warm at 35° to 40° C., until albumen digested, *i.e.*, when a portion of fluid does not coagulate on boiling; then add 2·5cc. oil, and shake well. No permanent emulsion. Solution becomes acid on standing.

As far as can be seen, artificial pancreatic juice has but little power of saponifying. If the zymine contains steapsin, either it is in small quantity, or relatively inert. Yet as the whole subject of the saponifying action of normal pancreatic juice on fats is *sub judice*, very little precise reasoning can be done. The combination of cod liver oil with Kepler's extract of malt contains oil in a state of molecular incorporation; that is to say, no globules of oil are visible, even on considerable magnification (x600). Admixture of water with the preparation produces re-emulsification, causing the oil to reappear in the form of small globules. At first sight it might seem that this preparation would not be serviceable, since the admixture with fluid in the stomach would necessarily produce the emulsification, and so negative the value of the molecular incorporation. But apart from the fact that the gastric juice possesses some emulsifying power, it must be remembered that the globules produced are quite as small as those produced by the admixture of oil with pancreatic juice. Now, the administration of this preparation certainly permits of absorption and toleration of the oil in cases where it is not otherwise tolerated. Why is this? In what way can the pre-emulsification of oil save the pancreatic juice and bile work? since the process is a purely mechanical one, as far as we know, and since, presumably, the pancreatic juice and bile are secreted, whether the oil is ingested or not. Can it be that either the emulsifying elements in the bile or the albumen in pancreatic juice are deficient in quantity in such cases?

The questions suggested appear to me to be worthy of serious attention, and I shall be deeply indebted to any one who can suggest any method of inquiry which will lead to a satisfactory solution of these problems.

SOME EXPERIMENTS ON THE ACTION OF THE DIGESTIVE FERMENTS.

By JAMES JAMIESON, M.D., Melbourne, Honorary Physician Alfred Hospital; Lecturer on Obstetrics, &c., Melb. Univ.]

In these days, when excellent preparations of the digestive ferments have been placed at our disposal, it is important to know, as exactly as possible, the limits to their powers and uses. About pepsin there can be no doubt that it may with advantage be used as a help to digestion, given along with food in suitable cases. In the same way there can be no doubt as to the advantage to be derived from the predigestion of food by means of the pancreatic ferments.

But our knowledge of the latter is not yet sufficiently complete, to permit of a correct judgment of their value when administered by way of the stomach. It is with the view of determining what I believe to be still unsettled points in connection with them that I devised a series of experiments; and for help in carrying out these I am under obligations to Mr. Frederic Dunn, Public Analyst, Melbourne.

After the food has been subjected for a time to the action of the acid gastric juice, the portion which is not absorbed passes into the duodenum. The acid reaction is there neutralised, or even changed into an alkaline one, by the addition of the mixed biliary and pancreatic secretions. The ferments contained in the latter of these are thereby placed in a favourable condition for carrying on and completing the conversion, into soluble substances, of the portions of food not fully acted on, either by the saliva or the gastric juice. Starch is converted into sugar, proteids into peptones, and fat is emulsified or split up into its constituents. How active the progress of duodenal digestion may be, we are now able to judge, from the rapidity with which artificial digestion can be accomplished with the help of pancreatic extract of good quality.

But while we know enough about the amylolytic and proteolytic power of the ferments contained in the pancreatic secretion, in presence of an alkaline mixture, whether in the small intestine or outside of the body, we do not know so much about their action under other conditions. The object of the inquiry, whose general results I have now to communicate, was to determine, with exactness, the influence of hydrochloric acid, in various degrees of strength, on the activity of the pancreatic ferments, that acid being chosen for the purpose, because it is known to be the free acid in the healthy gastric juice. Hoppe-Seyler says ("Physiologische Chemie," pp. 263-4) that the pancreatic juice exerts its solvent action on fibrin, both in the alkaline and in the neutral condition, and even when very slightly acidulated by an organic acid. He also says (p. 268) that by the addition of free mineral acids, or free caustic alkalies, or salts of the heavy metals, pancreatic digestion is completely stopped. It is not stated at what strength the mineral acids do so; and this is a point of some importance. But there comes a further question, which requires to be settled more clearly than it yet seems to be, viz., the exact reaction of the mixed contents of the stomach for some time after food is taken. In a paper read before the Medical Society of Victoria by Dr. J. W. Barrett, Demonstrator of Physiology in the Melbourne University, and printed in the *Australian Medical Journal* for March, 1887, it is

stated that "the reaction of the stomach is not distinctly acid for 30 to 40 minutes after food is first ingested, and zymine continues to exert its influence until the acidity is pronounced." When this statement was made I ventured to express a doubt about its correctness. Most physiological works are exceedingly vague on the point, if they refer to it all. Foster (4th ed., p. 262) simply says:—"The advent of food into the stomach at once causes a copious flow of gastric juice." So Kühne ("Physiologische Chemie," p. 28), speaking of the lining membrane of the stomach, as observed through a fistulous opening, says that as soon as the animal has taken food the mucous membrane becomes moist, even dripping, and the surface of intensely acid reaction. The following statement from Landois and Stirling (1st ed., p. 328) is more specific:—"Free hydrochloric acid is detected in human gastric juice within 45 minutes to one to two hours after a moderate meal (Von den Velden and others), and three to four hours after a full meal (Edinger); the amount gradually increases during the process of digestion (Kretschy and Uffelmann).'" It is difficult to believe that there is not some misconception involved in this way of stating the question, in view of the explicit statement of Kühne, given above. Hoppe-Seyler (l.c., p. 213) also says that the gastric juice of man and other animals is of intensely acid reaction; physiologists generally being further agreed that the free acid contained in the normal gastric juice is the hydrochloric. Beaumont, whose work on the physiology of digestion is still referred to as a storehouse of reliable observations, speaking of the condition of the mucous membrane of St. Martin's stomach, says:—"When food or other irritant has been applied to the villous membrane, and the gastric papillæ excited, the acid taste is immediately perceptible" (2nd ed., p. 96). This was found, though just before, when the stomach was empty, the mucus had not the slightest character of acidity.

It is certain, of course, that the degree of acidity of the mixed contents of the stomach will depend, for a time at least, on the amount and quality of the food, on the rapidity with which it is swallowed, and to some extent on the quantity of saliva mingled with it. But the suggestion contained in the quotation from Landois, that hydrochloric acid can be detected only three to four hours after a full meal, under normal conditions, is inconceivable. Gastric digestion goes on only in the presence of free acid; and if the statement is correct, it would follow that after a full meal the food introduced into the stomach is not acted on by the gastric juice for three or four hours. In opposition to this, it must be remembered that, according to Beaumont's observations, the digestion of most kinds

of animal food is completed within four hours, and of some kinds in one to two hours. The observations of Kretschy and Uffelmann, which are fully summarised in "Schmidt's Jahrbücher," Bd. CLXXIX., No. 2 (1878), showed that the stomach contents were already highly acid, three-quarters of an hour after the chief meal. The former, it is true, found the maximum intensity of the acid reaction attained only after four hours, while the latter fixed it at only an hour and a half. It must be assumed, therefore, that a considerable measure of acidity is generally reached very soon after food is introduced into the stomach, sufficient, indeed, to set the process of digestion in full train.

With this preliminary discussion of the condition of things, as regards the normal acidity of the contents of the stomach after a meal, I may now proceed to give shortly the results of our experimental inquiry.

The zymine used was obtained direct from Messrs. Burroughs, Wellcome, & Co., through their representative in Melbourne, and was found to act powerfully on starch, completely dissolving a thick mucilage in a few minutes. This it did either with alkaline or neutral reaction, the latter condition being not less favourable than the former. The quality of the article having thus been proved, the influence of hydrochloric acid on its amylolytic power was then tested. The procedure was to boil 10 grains of arrowroot in 20cc. of water, and add the acid in a proportion by weight of $\frac{1}{10000}$, $\frac{1}{5000}$, and $\frac{1}{1000}$, two grains of zymine being then added and thoroughly mixed. Each mixture was then kept at a temperature of 95° F. for two hours. Even the weakest proportion of hydrochloric acid ($\frac{1}{10000}$) had a distinct inhibiting action on the ferment. The mixture became thin, but when filtered there was still some of the starch mucilage left. With the strength of $\frac{1}{5000}$, the inhibition was almost complete, little of the starch being brought into solution; while, with the $\frac{1}{1000}$ strength, it was found that even after two hours the starch mucilage was scarcely altered. As it is known that the pure gastric juice may contain at least three parts of hydrochloric acid in 1,000, and as a proportion of two parts per 1,000 in a pepsin mixture is most favourable to the rapid digestion of animal substances, it is safe to assume that food cannot be long in the stomach before it attains an acid reaction equivalent to at least one in 5,000, a strength at which the amylolytic action of the pancreatic ferment is kept in abeyance. It is more than doubtful, therefore, if any appreciable help to gastric digestion can be got from the administration of zymine by the stomach.

But even so, the further question remains, whether it is not

possible that the ferment may pass through the stomach unchanged, and so be capable of helping digestion in the small intestine, after a neutral or alkaline reaction of the chyme has been brought about. It may be given, of course, two or three hours after a meal, and enclosed in some casing, as in the well known tabloids, with the hope that it will thus escape the action of the acid gastric juice, and be set free only after the pylorus is passed. But this must always be taken as a very doubtful mode of administration, there being room for uncertainty whether the capsule or casing may not dissolve, either too soon or too late, and so the elaborate precaution fail.

For the purpose of determining the probable fate of the pancreatic ferments, when exposed to the action of the acid gastric juice, the following experiment was tried:—To a mixture of five grains of Fairchild's scale pepsin in 20cc. of water, acidulated with HCl in the strength of 1 to 1,000, there was added five grains of zymine. This was kept at a temperature of 95° F. for an hour and a half; sufficient time to allow of the digestion of the zymine, if it is liable to be acted on in that way. At the end of that time the mixture was rendered alkaline by the addition of two grains of bicarbonate of soda. To one half of it there was added ten grains of moist fibrin, and to the other the thick mucilage of ten grains of arrowroot, and each kept at 95° F. for an hour. At the end of that time the fibrin was almost completely dissolved, showing that the trypsin of the ferment was still active. The effect could not be owing to the pepsin, which does not act in an alkaline mixture. The starch in the other half was to a great extent dissolved, though not so perfectly as had previously been found to be the case, when fresh zymine, in rather less amount (gr. ii.), acted on an equal quantity of starch. The zymine therefore was comparatively little injured by the treatment to which it had been subjected, though there was apparently some deterioration of its amylolytic power. This was probably owing simply to the continued action of the acid, and to test this further the following trial was made:—A mixture of five grains of zymine in 20cc. of water, containing $\frac{1}{500}$ part of hydrochloric acid, was kept at 95° F. for two hours. An alkaline reaction was then produced by the addition of two grains of bicarbonate of soda, and half of the mixture tested with fibrin and starch, as in the previous experiment. After an hour it was found that the starch, though to some extent liquified, had not been dissolved, as it is by fresh zymine. The fibrin, also, was still in large masses, and, indeed, not greatly altered. The ferments had, therefore, been to a distinct extent injuriously affected by exposure to the action of hydrochloric acid, of strength not greater than may probably enough be met

with in the stomach after an ordinary meal. The effect was simply owing to the acid, and if the pepsin had exerted any action, it could hardly have failed to cause complete destruction of this small amount of animal matter in the state of fine powder. It may safely be said, I think, however, that these ferments when kept in contact with an acid mixture, undergo such a measure of deterioration that it must be doubtful whether benefit can be expected from them, when they are again placed in more favourable conditions in the alkaline juices of the small intestine. This being so, it may further be said that pancreatic extracts of any kind can only be used, with certainty of advantage, for the predigestion of food, and of their beneficial use in that way there is no room for doubt.

If I were allowed to make a further practical suggestion it would be this—that even in cases of imperfect gastric digestion, it is doubtful if more than very temporary advantage can be got from the use even of pepsin. Where the stomach fails to do its work properly, the deficiency is more probably of acid than of ferment, and the administration of muriatic acid some time after food, and in more liberal dose than is customary, may better be depended on for direct effect than the giving of a few grains of pepsin. However, since it is true in this, as in a good many other of our curative procedures, that we are not always fully enlightened as to the exact condition present, there may sometimes be discretion shown in firing both barrels and giving the two together.

The inquiry which I proposed to enter on turned out much more laborious than was expected, and the results have not been quite perfect. I have not thought it necessary to trouble you with details of the experiments made. These, however, were carefully carried out by Mr. Dunn, and I hope to be able to publish quantitative details in some other form.

MYOSITIS OSSIFICANS.

[By ALFRED AUSTIN LENDON, M.D. (Lond.), Lecturer on Forensic Medicine in the University of Adelaide, Honorary Assistant Physician, Adelaide Hospital; Honorary Medical Officer, Adelaide Children's Hospital.]

The above title is a convenient abbreviation of the somewhat cumbersome, though more expressive, term employed in Germany, (*Myositis Ossificans Multiplex Progressiva*) to designate a disease of which there are very few cases on record, although I venture to pre-

dict that in the future instances will be more often discovered in Workhouses and Homes for Incurables. Of this disease I am enabled to bring before you notes and illustrations of two cases, one having been under my observation for the two and a half years preceeding death, and the other having been accidentally discovered in an old volume in the library of the late Robert Waters Moore, sometime Colonial Surgeon of this province, and shown to Professor Watson as a curiosity of medical literature.

CASE I.

J. W. A——, who died on July 22nd, 1886, at the age of 46, was born in Cornwall a month before his parents emigrated to Australia. His family history is good, his father having lived to the age of 74 years, and his mother to that of 82 years. He was one of a family of eleven, of whom two pre-deceased him, one in early life of fever, and the other, a sister, at the age of 50, of pulmonary and intestinal phthisis, aggravated by years of constant and devoted attention to her brother. Of the eight surviving members of the family all are healthy except a sister, who is supposed to have weak lungs; but one brother and one sister are said to have had rheumatic fever. There is no history of gout.

The patient was a healthy baby with the exception of an attack of convulsions during teething, and he was an active boy. The disease is supposed to have commenced when he was about eight years of age, although prior to this it is known that he was always clumsy with the right arm, and unable to supinate the forearm, so that he invariably held his spoon underhand, but at the aforesaid age his schoolmaster, chastising him with a ruler, inflicted a blow across the shoulders, in consequence of which a huge lump formed, for which he required medical advice: dozens of leeches were applied, and every endeavour made subsequently to "gather it:" a stiff shoulder (the right, it is believed) was the result, and this formed the subject of a consultation between Drs. Beyer and Mayo, who considered that it was an unusual case of rheumatism. Stiffness seems to have invaded other muscles, and incapacitated other joints, creeping on very gradually indeed; but it is certain that injuries trivial in character were responsible for some, if not all, of these extensions of the disease; for it is remembered that when at school a blow stiffened one of his legs, and later on when he was a lad of fourteen years of age he was seated on a bench when some one in play slapped his thigh: he started crying, and was reproved for his babyishness; but next day he justified himself by showing his mother a huge lump (not termed a bruise), greatly to her astonishment; and, again, when



Plate I





about 25 to 30 years old, a fall down a cellar caused the leg which was already stiff to be bent backwards, and rendered it much worse.

When he left school the disease had so far progressed that he was unable to stoop to put on his socks or tie his shoes. The next fifteen years of his life were spent at Gawler as assistant to a store-keeper. For six years he managed to serve behind a counter, although unable to stoop low or reach very high, but as he became more crippled he was made clerk and cashier, standing always at a high desk. He sat very awkwardly at meals, and on this account never joined the family when they had company. At the age of thirty he left this occupation, being utterly helpless to clothe or feed himself, and the remainder of his life was spent at his parents' home, and after their death at his sister's. His general health was always good, and his intellect unclouded. His disposition was cheerful and contented, reading being his chief occupation. Dr. Mayo had him under observation for about thirty years, and remembers the case clearly: at one time he entertained the idea of treating him by salivation. A brief description of his condition when seen in December, 1883, will be rendered more intelligible by a glance at the accompanying plates from photographs taken after death.

The whole of the day was spent out of bed: after being dressed in the morning he used to move along by himself with the aid of sticks from his bedroom to the sitting-room, a distance of only about a dozen yards, which, however, it took him a considerable time to accomplish: here he used to sit with his rigid body reclining at an angle of 45° with the horizon, the buttocks just touching the edge of the sofa, the head resting upon a small cushion nailed to the wall, and the back being supported by pillows, which he always arranged for himself by means of his sticks. He could not stand alone without his sticks, and if he fell down was quite unable to rise, but a favorite attitude for reading a newspaper or book was leaning against a table. He had sufficient movement in the right elbow, though scarcely any in the left, to allow him to turn over the pages with a couple of shorter sticks, for which he now exchanged his walking-sticks.

His appearance in the upright posture is well shown in Plate I., the head being slightly flexed on the chest, the upper limbs abducted, the forearms pronated, the elbows slightly flexed, as also the fingers, the left hand touching the outer aspect of the thigh, the right hand being more in front. The hands were clawed, and the interossei wasted. The left lower limb was slightly flexed at knee and hip, and advanced in front of the right, which was bent at the knee to very nearly a right angle, the fore part of the right foot only

just touching the ground. Both legs were spindle-like, and the left foot was fixed in a position of talipes equino-valgus. The great toes were considerably adducted, rather short, and perfectly rigid. The second toes projected beyond, and pressed slightly into the great toes, and the third toes were unusually large.

In walking the left foot was advanced an inch or so, the sticks brought up into position, and then the right foot was shuffled forward a little: progress was naturally very slow, and he was unable to surmount any obstacle by raising the foot, so that even the thinnest of doormats had to be removed. It was a curious but painful sight to witness the process of putting him to bed. Fatigued by his walk to the bedroom, he had still to stand a long time whilst being undressed and having a bed-sore attended to. He then moved to the side of the bedstead, and suddenly flung himself on to his back across the bed, and was afterwards rotated into the proper position: the effort seemed to exhaust him for a few minutes: then the undressing was completed, and the ulcers of the legs dressed and bandaged: pillows were placed under the head, but the limbs sank into the soft feather bed. Plate II. shows well the attitude the limbs would assume were he placed on a hard mattress instead.

In appearance he was of medium height, gaunt, and cadaverous, with very little hair on his face, that of the scalp being sparse and fine, and of brown colour; the eyes were blue: the skin was shiny and greasy, and stretched over the bony protuberances with very little subcutaneous fat. Dentition was fairly good, but the jaw could only be opened for a short distance; he could swallow solid food, if cut up small, and was always fed with a spoon. He could frown and make grimaces, and the ocular muscles were also unaffected. The external genital organs were well developed. Over the sacrum was a bed-sore which had existed for over six years at least, and from which pieces of bone were constantly exfoliating. On the legs were ulcers for which he had worn elastic bandages for some time, but there was no œdema. The various ossified muscles were felt to be immovable on the subjacent bones, the most remarkable being those on the lower limbs. Both on the fingers and toes were small sores, which are described as originating in callosities of the epidermis.

Very little change took place in his condition during the two and a half years he was under my observation, until within a few weeks before his death, when the bed-sores became troublesome, the supuration extending along the planes of cellular tissue, the discharge becoming terribly offensive, and gritty pieces of bone coming away





in numbers. Towards the last few days of his life he had retention followed by incontinence of urine, constant vomiting, and severe abdominal pain, necessitating morphine injections. He died of exhaustion.

The examination of the body was made about eight hours after death, by Professor Watson. The coffin had to be made of unusual depth and width, on account of the distortion of the trunk and limbs. Several photographs were taken of the cadaver. No. 1 shows the body in the upright position poised upon the ball of the left great toe, and with the sacrum resting against the edge of a table. In taking this one of the bones of the great toe broke with an audible snap. No. 2 represents the man as I was accustomed to see him during life in bed, save that now there are no supports under the head or limbs, and only the left elbow and lower part of the trunk touch the table. Other views show the body lying on either side.

There was noticed a slight recent abrasion on the left frontal eminence, probably sustained after death: also ulcers on both legs and on the dorsal surfaces of the left middle and right little fingers. The large sacral bed-sore, from which a copious and horribly fetid purulent discharge was issuing, was found to open directly into the lower portion of the spinal canal, the bones being exposed and carious, and further the pus was burrowing into the retro-peritoneal areolar tissue on the right side, presumably along the nerve trunks of the sacral plexus.

The head, hands, and legs were not dissected, so that the examination was necessarily somewhat incomplete, but the specimen produced was removed *en masse* and allowed to macerate. The muscles of the body, although reduced in bulk, had retained their natural red colour; the thoracic and abdominal viscera were all healthy, there were no pleural adhesions, and no atheromatous degeneration of the heart or great vessels. A microscopic examination was made of the lower portion of the cervical cord, but revealed nothing unusual except a sprinkling of corpora amylacea. The stiffness of the neck, in which there was a diffused curve with the concavity directed forwards, was ascertained to be due to ossification of the capsular ligaments, and synostosis of the neural arches, and not to ossification of the deep muscles of the neck. All the muscles above the clavicles and scapulæ had been spared, including those of mastication, facial expression, and deglutition, and the articulations of the jaw, and of both clavicles were also free.

The Skeleton.—The specimen which has been preserved, and which comprises the vertebral axis as high as the sixth cervical body, the

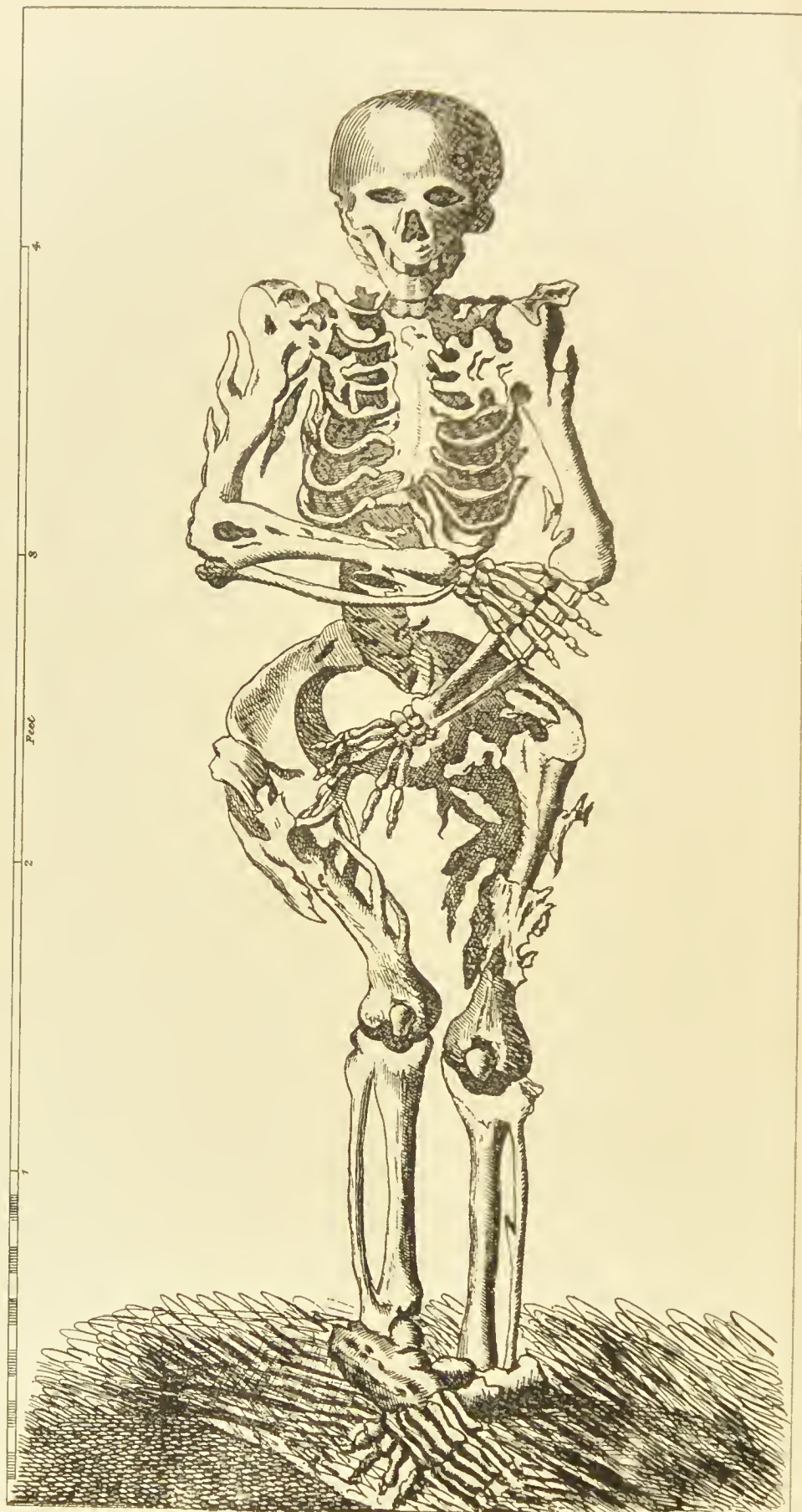
shoulder and pelvic girdles, and the limbs as far as the elbow and knee joints, together with about two-thirds of the thoracic wall, will repay a careful inspection.

For simplicity and convenience of description it will be best to start from the extremities towards the trunk.

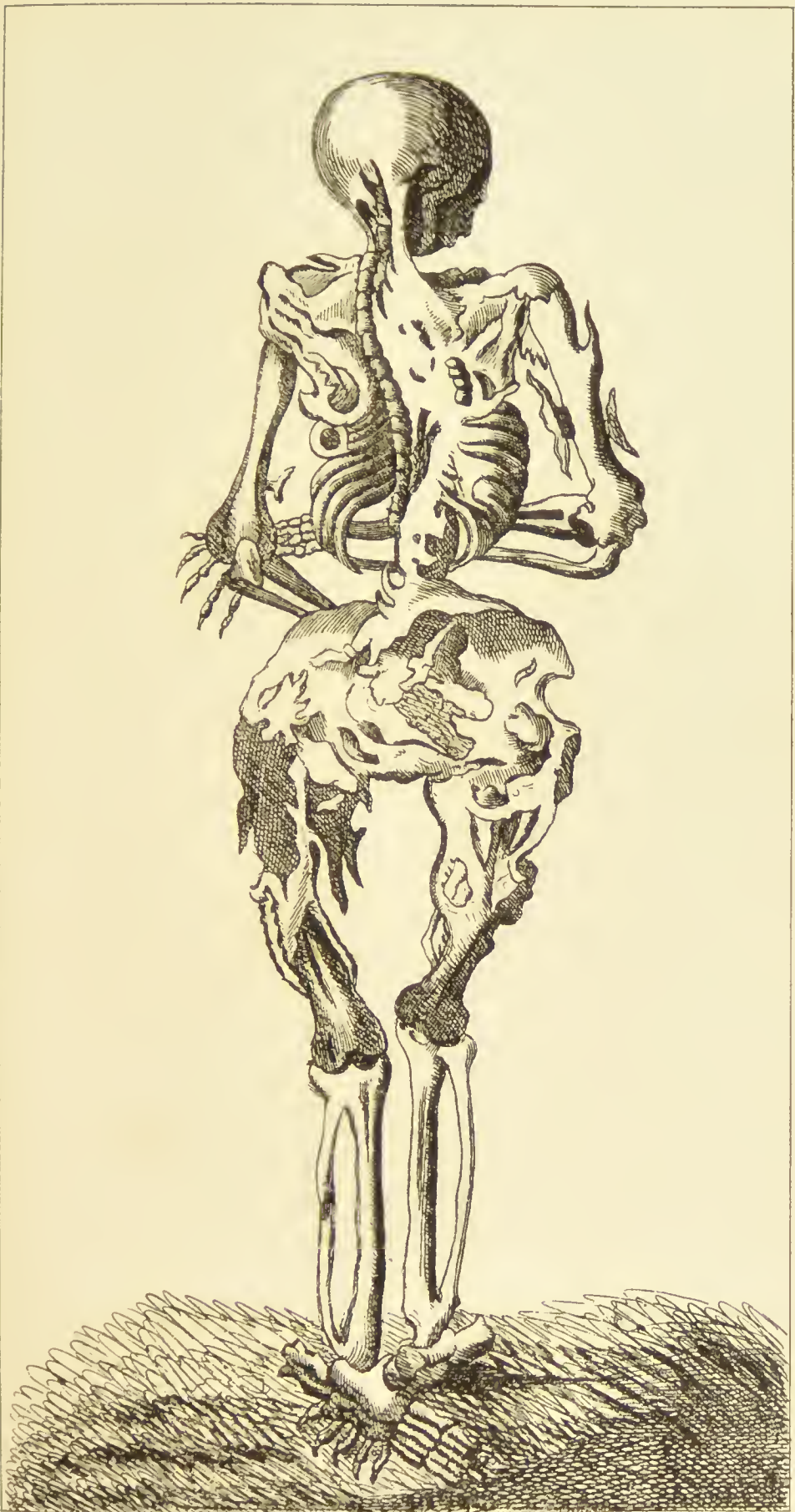
(a) *Upper Limbs and Shoulder Girdle*.—Both humeri are somewhat abducted from the axis of the trunk, and immovably fixed in this position, the right by ossification of the deltoid from its acromial origin to its insertion, the left by implication of the coraco-brachialis, but there is no synostosis, and indeed the articular surfaces were seen to be covered with cartilages, though of a degenerate or degraded kind. The scapulæ, although separated from the thorax by unaltered muscle, are immovable on the trunk, their inferior angles being soldered by a buttress of bone on the right side to the eighth and ninth ribs, and on the left side to the seventh and eighth ribs. In addition they are attached to the vertebral column by the somewhat symmetrical ossification of the latissimi in nearly the whole of their length from the dorso-lumbar spines to beyond where they blend with the scapular slips of origin: these bony sheets formed a kind of carapace to the erectores spinæ lying beneath them quite unaltered. There was slight movement still in the left elbow in spite of the almost complete ossification of the brachialis anticus, and the addition of a bony rim around the articulation. In the right elbow, in which there was slightly more free movement than in the left, the rigidity was due to a similar rim around the articular surface.

(b) *The lower limbs and pelvis*.—The ilia are fixed to the sacrum by the ossified sacro-iliae ligaments, but the pubic synchondrosis was not affected. The right hip joint is rendered immobile by ossification, in front of the anterior portion of the capsule and behind of the quadratus femoris, and the left hip joint by ossification of the upper part of the rectus femoris and the iliacus, and of the internal portion of the capsule. In addition there are rods of bone developed in the lower fibres of each gluteus maximus, and extending from the sacrum to the femoral insertion, simulating at first sight the sacro-sciatic ligaments: that on the left was exposed by the sacral bed-sore. The right femur is considerably flexed, and apparently slightly abducted. The left femur, on the other hand, is less flexed on the pelvis, and seems somewhat adducted. The pelvis itself is tilted upwards to a marked extent on the right side, and slightly projected forward also, in compensation for a spinal curvature, to be hereafter mentioned.

The interior of the hip and knee joints was but slightly altered.



FRONT VIEW



E. DILLER, GOVT. PRINTER, PHOTOLITH

BACK VIEW.

The hyaline cartilage was replaced by a fibroid substitution, and in the left knee it was slightly uneven, and the condyles were soft and spongy. This joint was absolutely immobile owing to ossification of the inner head of the gastrocnemius, which was broken through in the removal of the specimen. The right knee possessed a slight degree of mobility, and was not externally much altered. The huge projection on the back of the femur (so well shown in Plate II.), by which the saphena vein was deflected, proved to be not a solid mass of bone as was thought, but a phantastic arrangement partly stalactitic, partly fretwork, of soft bone covered with a spongeoid layer, and evidently still in process of development. The meshes are wide, and there are grooves through which ran the popliteal artery and vein, separated from one another by an osseous ridge formed in the adventitial layer of their sheath. The internal popliteal nerve ran by itself through the middle of the mass, isolated from the external popliteal nerve by a buttress of bone.

(c) *The vertebral column and thorax.*—There is no lordosis, but a dorso-lumbar curve, with slight rotation, to the right side. Indirectly the latissimus on each side being ossified is sufficient cause for the spinal rigidity, but more directly it is due to ligamentous rather than muscular ossification. The capsular ligaments of the articular processes and many of the supra-spinous ligaments are converted into bone, and in addition there is a general synostosis of the neural arches. The anterior common ligament is ossified in the upper dorsal region, and in the lumbar region, but not in the lower dorsal region, where the intervertebral discs have macerated out.

All the ribs, with the exception of the eleventh and twelfth on the right side, and the eleventh on the left side, are ankylosed to the vertebral column by ossification either of the costo-stellate or one or other of the costo-transverse ligaments, the twelfth on the left side having in addition a bony connection with the transverse process of the first lumbar vertebra, formed in the lumbo-costal ligament of Henle.

A few processes resembling exostoses are seen in different situations, notably a slender spike on external surface of the left ilium, and loose portions of bone were found in the left pectoralis major and the left peronei.

The bones are found to have undergone a considerable amount of eccentric atrophy, and are in consequence rather light.

CASE II.

The case of Wm. Clark, as described in Chapter XI. "Of Remarkable Persons Born in this County," Book IV., and Vol. II. of the

"Antient and Present State of the County and City of Cork," by Charles Smith. (Dublin: Printed by A. Reilly for the Author, and sold by J. Exshaw, Bookseller on Cork Hill, MDCCCL.)

"William, the son of John Clark, a soldier in Sir Richard Aldworth's Company, was born at Newmarket, in this county, in 1677. In his infancy he never was observed to turn his head round, nor bend his body. When a boy he could only reach his hands as high as to the level of his elbow, nor could he ever put them behind his back. His under jaws being fixed, he could never open his mouth, but his teeth being broken by some accident, he sucked in spoon meat, which was his chiefest food. He spent a great part of his time in preparing his diet: when he took any solid food he laid it on a long flat knife and pressed it with a stick made for the purpose, and so forced it within his teeth. Though he was often intoxicated with liquor, he never vomited but once, and was then very near being suffocated. When he walked, he was always obliged to step first with the right foot, which he did with much difficulty; he then dragged the left foot to the right heel. When he fell by accident he was never able to rise without assistance. When he lay down, he had cavities made in his bed, in which he placed his hips, heels, and elbows. In his youth he made a shift to creep with difficulty through the village of Newmarket; but as he advanced in years he grew more unactive, so that at last he could scarce go the length of Mr. Aldworth's kitchen, where he spent most of his time. That gentleman maintained him in charity while he lived; the only use he was capable of being put to was, that of watching the workmen, for when he was once fixed in his station it was impossible for him to desert it. He generally stood in a kind of centry-box, with a board placed in a groove as high as his breast for him to lean upon. He had always a boney excrescence issuing out of his left heel, which sometimes grew to the length of about 2 inches, and when it shed, as a deer does its horns, it still continued to sprout as before. Towards the later part of his life several long excrescences were observed in his thighs and arms, which he had not in his youth. He died in the year 1738, in the 67th year of his age; the cause of his death was probably an inflammation of his lungs, for as they adhered to the pleura and ribs, they were immoveable, the diaphragma could scarce change its situation, and the capacity of the thorax was always nearly the same; for these reasons he had a constant quick respiration, which terminated in a fatal oppression, otherwise he might have lived till all the bones had been so much increased as that the ribs and whole thorax would become one trunk of bone. He had been 5 days dead before he was opened, so that the muscular

parts began to putrify. His viscera had nothing in them remarkably preternatural, except his lungs, which adhered closely to the pleura.

The posture into which he fixed, sometime before his death, is somewhat like that of the Venus of Medicis. The vertebræ of his back are exceedingly bent inward, with an inclination to the left hip. The os sacrum is so bent outward as it is not seen when the skeleton is viewed in front; there is scarce one bone in the whole of it's proper natural form, except those of his legs, which are not much distorted. He is one entire bone from the top of his head to his knees. The sutures of his skull are more united than in common skulls. The jawbones are entirely fixed, as is before mentioned, and the hinder teeth joined together. A bone grows from the back of his head, which shoots down towards his back, and passes by the vertebræ of the neck at about an inch distance; this bone unites to the vertebræ of the back and the scapula of the left shoulder, from whence it disengages itself again, and continues distinct, till it divides into two, towards the small of the back, and fixes itself into the hip bones behind. The vertebræ of the back are one continued bone. In the fleshy parts of his thighs nature seems to have sported herself in sending out various ramifications from his coxendix and thigh bones, not unlike the shoots of coral, but infinitely more irregular, some behind and some before, some in lumps and clusters, and others in irregular shoots of 8 to 9 inches long. His knees are pretty close together; they incline to the right; his left shoulder is the highest. One of the bones of his left arm was broken once by a fall, and nature had shot out another bone a little above the bending of the arm, which unites to the broken bone, and makes it much stronger than it was before. All the cartilages of his breast, four only excepted, which served to move his breast in respiration, were turned to bone. When he was dissected a bone was found in the fleshy part of his arm quite disengaged from any other bone; it is very thin, about four inches long, and the 4th of an inch broad, with several ramifications; what is odd is that while these bones were growing he never complained of any pain in his muscles. It would require a volume of itself, composed of a new kind of osteology, to give a minute description of this surprising skeleton and its irregularities, being as difficult a task, as to describe Calypso's grotto; however, the design is undertaken by the gentleman who has this curious skeleton in possession, Dr. Edward Barry of Dublin, who has composed a learned and accurate tract on the subject, with a compleat history of his life; therefore, I shall not pretend further to anticipate the account intended to be published by the Doctor, when his leisure shall permit him to put his notes in

order for that purpose; but as he has been so kind as to communicate them to me, I have given the above short abstract out of them, rather to raise than gratify the Reader's curiosity, till the Doctor's more accurate performance shall appear; and this I have done the rather, as some relations already published in the *Philosoph. Transact.* of this skeleton are far from being accurate, nor is the history of his life given there much more just."

Note.—A photo-lithograph has been taken of the wood-cut which accompanied the foregoing description of Clark's skeleton, and in studying this it must be remembered that the terms right and left have to be transposed, and moreover a considerable allowance must be made for artistic license, the engraving probably not being the work of a trained anatomist. However, it shows well the ossification of the fused left latissimus and trapezius muscles throughout their whole length from the occipital protuberance to the sacrum and iliac crest, and their attachments to the vertebral spines and to the scapula; in the left forearm the supinator longus is seen to be completely ossified, and as fragments may be noticed the insertions of the deltoids and portions of the brachiales antici and bicipites humeri and pectorales majores; the intercostal and diaphragmatic muscles are not involved, there is marked curvature of the spine with the convexity in the dorsal region to the left, and a compensatory curve in the neck to the right; there is apparently no lordosis, and the femora are in fairly natural position, surrounded by ossified masses of the vasti and hamstrings; the tibiae and fibulae appear to be soldered together by ligamentous ossification, and so, too, are the tarsal bones, but the process does not appear to have invaded the muscles below the knee and elbow joints, with the exception of the left supinator longus, which is evidently the bone described as being formed in consequence of a fracture of the arm, of which, however, no trace can be detected in the illustration. Where there is joint ankylosis it appears to be the result of muscular and ligamentous ossification, and not true synostosis.

REMARKS.

In a recently published paper by Mr. Sympton*, of Lincoln, will be found an interesting summary of what is known about this curious affection, as well as several references to cases reported by previous writers, in addition to which I may mention the specimen in the Royal College of Surgeons of England, and cases described

* "British Medical Journal," 1886; vol. II., p. 1,026.

more or less fully by Cæsar Hawkins*, Skinnert†, Nicoladoni‡, Godlee§, Helferich||, Volkmann||.

As most of these cases have been described during life-time and are incomplete, I have not hesitated to republish the history of Wm. Clark, forming as it does with my own case and that of Mr. Cæsar Hawkins, a trio of instances of myositis ossificans which closely resemble one another; an additional reason, however, for doing so is the suggestion that in this case we may perhaps have lighted accidentally upon the history of the original of the specimen in the Museum of the College of Surgeons, of which, I believe, but little is known, except that it was obtained by Hunter.

As in Adelaide we have only the nucleus of a medical library of reference, I have been unable to study the whole of the literature on the subject, and my remarks will therefore be brief.

With respect to diagnosis, the only disease with which this might be confounded in its earlier stages is, I think, the rare form of hereditary multiple osteomata, of which an illustration is given in Pepper's "Elements of Surgical Pathology."¶

Myositis ossificans has in all probability little, if anything, in common with the ossification (or calcification) which sometimes occurs in the tendinous attachments of muscles as the result of oft-repeated though comparatively slight traumatic irritations, and of which we have familiar instances in the "drill bone" in the deltoid of the old Prussian Army, or the bone developed in the adductors of the thigh in those who ride much. Similar bony growths have been observed in the brachialis anticus after violent gymnastic exercise,** and in the adductor longus from slipping:†† all these are of purely local origin and may be dealt with surgically. In myositis ossificans, however, the muscles themselves are primarily affected, and the process tends to become generalised, the result being the development of true bones, exhibiting not only compact and cancellous tissue with periosteal covering, but even at their extremities true epiphyses covered by cartilaginous surfaces, reminding one of the exostosis cartilaginea of Virchow.‡‡ Some of the masses of bone are dense on

* "Holmes & Hulke's System of Surgery," 1883 edition; vol. II., p. 168.

† "Medical Times and Gazette," April 20, 1861.

‡ "Medical Times and Gazette," June 22, 1878.

§ "Clinical Society's Transactions," vol. XIX.

|| "Congress of German Surgeons," 1887.

¶ "Elements of Surgical Pathology" (Pepper), p. 448.

** "Medical Times and Gazette," Podrasky, 19-7-73.

†† "Medical Times and Gazette," Thriar, 31-7-80.

‡‡ Volkmann, Congress of German Surgeons, 1887.

section, such as the left gastro-*cnemius*; others much more porous in structure, and branched like coral: this may be merely a question of age and growth, but however slow the process may be in development, at its onset it is often very acute, and obviously of an inflammatory nature, commencing immediately after an injury, and in some cases even going on to suppuration.*

In my own case, and I think also in that of Wm. Clark, it is a notable fact that the disease is mainly seated in the muscles of the appendicular skeleton, and has spared those of the axial skeleton. Possibly these might have become affected later on, as they appear to have been in Hawkins' case. Ossification or calcification of the vertebral ligaments is of such common occurrence that the question of its relation to the process in the muscles need not be discussed. It is a matter for regret that no evidence, positive or negative, can be adduced with respect to the existence in these cases of that peculiar deformity of the toes and thumbs which has been noted by others.†

With regard to the etiology one cannot help agreeing with Mays' opinion that congenital predisposition is an important factor in its occurrence; on the other hand there seems to be but little evidence to support Helferich's suggestion that possibly the predisposition may be hereditary. So far as the influence of rheumatism is concerned, although in my case there is a distinct family history of this complaint, I think it would be dangerous to draw any inference from this fact, more especially as the patients themselves do not seem to suffer from rheumatism, nor do their joints show any particular evidence of rheumatic arthritis.

Hayem has hinted at the possibility of the seat of the disease being in the spinal cord and peripheral nerves, but most writers believe it to be independent of the nervous system.

That local injuries have a great deal to do with determining the attacks of inflammation, I think is plainly shown by mine and similar cases. Pinter dissents from this view, and contrasts the frequency of injuries to children with the rarity of the disease, but I would point out that however common injuries to children may be, the predisposition to the termination of slight injuries in the ossification of muscles must necessarily be extremely rare. The want of symmetry in the lesions is an element in favour of the theory of local injury superadded to congenital predisposition.

The various photographs have been reproduced by the process of

* Helferich, Congress of German Surgeons, 1887.

† Sympson and Helferich, *vide supra*.

photo-lithography, and for this I am much indebted to Mr. Spiller, the Government Printer, without whose kind assistance it would have been impossible to have had the illustrations which accompany this paper.

I would also wish to express my deep sense of obligation to Professor Watson for his assistance in various ways. Indeed, to him must justly be attributed whatever merit this communication may possess.

ON ANÆMIA.

[By JOHN REID, M.A., M.D., C.M., Melbourne, Victoria.]

[ABSTRACT.]

The author commences his paper with a synopsis of the subject. He then alludes to pernicious anæmia and the anæmia of smokers. The climatic conditions of the Australian colonies as influencing the physique of the native-born are discussed.

"The youth is said to be anæmic. He is pale and tall, perhaps, but lacks in colour. He is, as a rule, in manhood but half developed; his chest is puerile, and will never possess the sternum or shape of a properly-developed member of the genus *homo*." These conditions are partly referable to ill-cooked food, and in part to the climate.

As regards the treatment of anæmia, the author disbelieves in the routine use of iron, and states that the anæmia associated with menstrual disturbances in women is frequently successfully treated by "antimonial preparations."

The author states, in conclusion, "Sufficient has now been said to emphasise my thesis that iron has been too much extolled as the one remedy for anæmia; that the pernicious results to scientific medicine and to suffering humanity arising from the using of iron as a panacea in this state of the system has been clearly placed before you with a view to excite an interest in the subject, and that the writer looks on anæmia in the same way as on dyspepsia—as being a state of the system, or symptom, if you prefer it, existing in connection with many diseases, and that it ought to be treated in accordance with general medical or surgical principles, as the case may demand."

SECTION OF SURGERY.

ADDRESS BY T. NAGHTEN FITZGERALD, F.R.C.S.I., Chairman,
Lecturer on Clinical Surgery in the University of Melbourne,
Senior Surgeon to the Melbourne Hospital.

THE PROGRESS OF SURGERY.

MR. PRESIDENT AND GENTLEMEN—When I became aware that the Committee of this Intercolonial Medical Congress had paid me the honour of electing me to preside over the Surgical Section, I felt very sensible of the distinction accorded to me, and the more so as I could not but realise how abundant, in South Australia itself, is the choice in scientific surgeons, who not only possess high professional qualifications, but have made themselves personally distinguished in their art. I assure you, without affectation, that I accepted the honour so generously tendered with some diffidence and self-distrust. For I bore in mind that, in opening this Section I should necessarily have to review the surgical history of the last half-century, and that such a labour would demand a more intimate familiarity with the progress of the times than is possible to one engaged in the daily labour of professional duties. The pleasure of taking part in this important gathering, however, overcame my self-distrust, and I felt sure, moreover, that you would further extend your kindness by permitting me to deal with the subject in my own way.

Let me first offer my felicitations upon the completion of the first half-century of the history of this colony—a half-century, as we all remember, coincident with the reign of Her Most Gracious Majesty the Queen. It is also just 50 years since a memorable meeting was held in Exeter Hall, London, to found that wonderful organization, the British Medical Association, whose growth and influence have reached a degree without parallel and without precedent, and with which much of the recent progress of surgery has been identified.

If we consider what have been the most important events which have marked the progress of surgery, the first will be found in the discovery long ago by Ambroise Paré of the use of the ligature, without which even the coarsest operations were impossible. This discovery led up, in more recent days, to the practice of torsion, and to the employment of catgut and tendon ligatures, which have rightly, to a very large extent, replaced the hempen thread. The

next discovery of prime importance belongs to our own era, and was given to the world by members of the English-speaking race. Need I say that I allude to the invention of anæsthesia by nitrous oxide, ether, and chloroform, through which Horace Wells, Morton, and James Simpson made practicable a host of operations which formerly could not be attempted. This discovery, coupled with other advances, has completely revolutionised the entire *pratique* of surgery. Some of us can well remember the operating theatre of old, ensanguined like a slaughter-yard, the air rent with the shrieks of the unhappy victims quivering under the knife of the operator, whose one object was of necessity to hurry over his work, too often sacrificing safety to celerity.

When the Queen began her reign, Abernethy—quaint, cross, sometimes rude, but always large of heart and clear of head—had just gone to his rest; the coarse but eloquent Dupuytren had been laid in Père-la-Chaise, and in his place at the Academy stood the philosophic Brescher, while at the Hotel Dieu he had been followed by the dexterous Roux; Velpeau had gone to La Charité; Delpech lay slain by an assassin's weapon; Lisfranc was at La Pitié; the kindly Broyer was busy with his delicate manipulations; and Civiale was initiating lithotripsy. In Germany, Dieffenbach was explaining tenotomy and splitting stammering tongues; Langenbeck was experimenting in irrigation; and Graefe's greatness was just dawning in Berlin. In London, the courtly Astley Cooper had but recently retired from the then most lucrative practice ever reached in the world to publish the last of his immortal quartos, namely, his treatise on the mammary gland. Over him, too, the grave was soon to close; and so also was it over his friend Charles Bell. Lawrence and Skey were the bright lights at St. Bartholomew's; Hawkins and Brodie held high places at St. George's; Guthrie was chief at Westminster; Fergusson had, indeed, migrated to the great metropolis of the world, but had not yet his home at King's; and Paget was but a beginner. In Dublin, Cusack, Crampton, Collis, Bellingham, and Carmichael were in the plenitude of their well-earned fame; while in Scotland Syme had not yet dreamed of that journey to the South which proved to him so full of profitless vexation.

Prior to the day of anæsthetics the periodical literature of surgery represented energy rather than research. Conservative surgery was not greatly in favour, and brilliancy was the chief object aimed at. The records of hospital practice were rather boastful than instructive. The difficulty of an operation, rather than the benefit to accrue from it, was most in men's minds, and unquestionably, on the score of boldness, there was nothing lacking. The deligation of

large arterial trunks was common. Lizars and others had tied the innominate for subclavian aneurism, and Wickham had tied both the carotid and subclavian for innominate aneurism. Plastic operations, especially the Tagliacotian, were not infrequent, and we can readily imagine what agony the patients must have suffered in skin transplantations when there was no chloroform. Lithotrity was growing into favour, although the recognition of its value was slow. Amussat had successfully cut into the colon, and he seems to have been the first to incise the trachea for the extraction of a foreign body. Mayo had only recently electrified all surgical London by, after ligaturing the femoral artery, amputating at the hip joint in less than thirty seconds. Syme had performed and described his now well-known urethral section. Excision of the elbow-joint has been done on a few occasions, but none of the other large articulations, save the shoulder-joint, had up to this time been saved from the amputating knife. Frequently in amputations the flaps were not at once sewn together, but were left exposed until "glazing" took place, sometimes even for two or three days.

With regard to abdominal surgery, we read of successful cases of ovariectomy by Jeafferson, King, Lizars, Smith, and others. The bulk of the operators, however, then and for some time after, predicted nothing but evil from such rash ventures. In this branch of surgery King, of Saxmundham, surpassed all his contemporaries, for, anticipating Tait, he fearlessly explored the abdomen for diagnostic purposes.

All this appears to represent the extent to which practical surgery had reached up to 1846. Meanwhile, however, it is certain that in medical education a notable improvement was taking place, and that both the process of teaching and the methods of examination showed a great advance upon what had hitherto been the rule. The London University had herein communicated an impetus which was both felt and acknowledged by all the other licensing bodies, and although the examination questions, as now read, appear exceedingly elementary, they were probably at that date regarded as severe. No doubt, during the early forties, the standard of medical education was low in the extreme. For the diplomas no arts test was demanded, and the standard for the highest qualifications then obtainable was considerably lower than that for the meanest qualification of to-day.

The social gulf that lay between the consulting physician or the operating surgeon and the general body of the profession was very pronounced, and created an amount of jealousy that we, living in 1887, can hardly conceive.

To be at all successful as an operator then, certain qualifications

were imperatively called for, which are not quite so absolutely necessary now. Firstly, the surgeon had to be a man insensible to the infliction of pain, little sympathetic in his nature, and indifferent if not dead to the sufferings of others. Next, manual dexterity, though always a surgical requirement, was of much greater importance than it is at present. A deliberate careful operator such as Lister would never have been a success, for operations had to be carried out as rapidly as possible from start to finish, at full gallop, and of course the performance was greatly impeded by the movements of the patient and the contractions and spasms of the muscles. Still it held good then as now, that no man, however skilful he might be, however learned or educated, could expect to command success unless chance, birth, or position had fortunately enabled him to secure a hospital appointment in early life. Yet a surgeon is born, not made, and there are men who could not become operators, notwithstanding the possession of all these advantages. To my mind the old adage is true, that a surgeon should possess in addition to a thorough theoretical and practical knowledge of his profession, "the eye of a hawk, the heart of a lion, and the hand of a lady." In the main the surgery of the day was almost exclusively in the hands of the metropolitan teachers, much more so than it is at present. There were, however, in the provinces some really great surgeons, and the names of James, De la Garde, Whipple, Clement, Wiekham, Jefferison, King, and Hay will always be remembered as those of men possessing the highest surgical skill, quite equal, if not superior, to their contemporaries in London, Edinburgh, and Dublin.

If the surgery was in the hands of a few, the surgical procedures permissible, as compared with those to-day, were also extremely limited. In fact, operations were in reality almost wholly confined to those which had to be performed either to relieve agony or to prevent a painful death. In children, whose feelings were matters not to be consulted, some little latitude was allowed, and in this way tenotomy crept into practice. If during this period any improvement or advance took place, it was very infinitesimal. Practical surgery, except in some special departments, such as ophthalmology, had virtually come to a standstill, and that in spite of the undoubted genius of its votaries. Operations could be devised, but they could not be carried out. Several of the major procedures, now of daily occurrence, were schemed by the old anatomists, such as Haller; and in the early part of this century John Bell designed ovariectomy for his pupil McDowell to perform in Kentucky. Few patients, however, could be found with fortitude sufficient to encounter the surgeon's knife, and thus death was allowed to be the only termina-

tion to many diseases now recognised as curable. With respect to the epoch of anæsthesia by ether in 1846, it is not for me to detail the history. It is familiar to everyone. You all know how Wells first used Sir Humphrey Davy's nitrous oxide; how Morton and Jackson plotted to patent the use of ether, and how the one betrayed the other; how Simpson, acting on the advice of his acquaintance Waldie, first boldly and successfully gave chloroform; how Liston, full of exultation at the discovery, wrote of its marvellous powers, and how Malgaigne jealously advised caution, and tried, but unsuccessfully, to damn it with faint praise. The story of anæsthetics is extant, and is written in all languages. So, too, is the story of the sudden development of operative surgery, which followed immediately. Both operations and operators multiplied with marvellous rapidity.

To pass to one other advance, allusion to which after the mention of chloroform will not be an anti-climax, I refer to the sudden improvement which took place in what may be designated "The Hygiene of Surgery." Extraordinary as it may seem, it is, nevertheless, a fact that, until the conclusion of the Crimean war no attention seems ever to have been paid to the lodgment of the sick or to the construction of hospitals. So completely had this subject been neglected that I believe Sir George Ballingall, in his lectures on "Military Surgery," was the only authority who, up to the close of 1857, ever considered it in public. Pamphlets, I admit, had appeared occasionally, but with reference only to the plan on which some particular infirmary should be erected, so as to utilise available land to the fullest extent. But the general hygiene of hospitals—light, ventilation, cubic space, &c., were up to the end of the Crimean war practically untouched subjects. The horrors of this campaign, the terrible sufferings of our magnificent army, and the courage with which the men bore their troubles, focussed the public attention in a manner that two cholera epidemics had failed to do. The result was Netley, with its school of hygiene. Still, as the fervour cooled, the subject would probably have been allowed to drop, but fortunately at this juncture the late Prince Consort came with his great personal influence to its assistance. Hygiene, especially military hygiene, had for His Royal Highness a singular attraction. He closely watched the institution as it rose on the banks of the Southampton water, inspecting and advising in a manner that astonished the engineers. This hospital was the first, I believe, ever built on the pavilion plan; the first ever constructed with regard to sanitary principles. When it was finished a school of hygiene was founded, and an education in the subject became a permanent feature in the

training of medical men for the public service. In this way hospital construction and skilled nursing came to receive proper recognition. To my mind this is one of the most extraordinary circumstances in the history of surgery, that intelligent and duly trained men, daily surrounded with surgical infective fevers, should so long have failed to perceive their connection with defective sanitary arrangements. In the medical literature of the time we often read of purulent absorption, as it was then called, of pyæmia and so forth, but our immediate fathers had no idea of their relationship with bad drainage and overcrowding. And this is the more strange, for old military surgeons, such as Pringle and Jackson, had repeatedly and in decidedly forcible language asserted the superior healthfulness of tents and bamboo huts over roofed walls and scrubbed floors. The long peace had numbed the sensibility of the nation, for not the slightest notice was taken of the teachings of these observers, and the experience of the Peninsular war was thrown away. Disastrous as it was in many respects, the Crimean campaign taught the lesson that surgical fevers were more fatal than typhus, and quite as infectious.

We who know more, may wonder at the slowness of our predecessors to appreciate these facts, but it would really seem as if great public questions require for their proper recognition some grievous catastrophe, some sudden revolution, some dencouement, to change the aspect from which, by long habit, they have invariably been seen. For some years preceding the Crimean war a gradual improvement had been taking place in the hygiene of the people. They were becoming more temperate, better clothed, and better fed; the worst forms of hospital fevers, the old gangrene and the sloughing phagedæna, with attendant nitric acid treatment, were becoming rarer, lingering about the Lock and Civil Infirmaries on the outskirts of the military stations; nevertheless, pyæmia and septicæmia in the later fifties and early sixties were regarded as inevitable concomitants of hospital life—matters, of course, for which Providence was mainly responsible. Students, fresh from the dead-house, passed into the wards, and, without hindrance or warning, attended obstetric cases. Surgeons, with hands uncleansed of the contamination of the dead body, cut into the living flesh, and wondered that the operation turned out ill. In short, surgical cleanliness was unknown. Gay, surgeon to the Royal Free Hospital in Gray's Inn Road, admitted, and in fact almost boasted, at an inquest, that he had frequently operated on a constantly used dissecting table; and, though this ostentatious brag was perhaps exaggerated in the telling, it may be taken as a not inexpressive sign of the times, that the admission did not evoke universal reprobation.

Spencer Wells, in his early practise of ovariectomy, paid, as we all know, minute attention to all the details of the process, these including a careful avoidance of everything likely to convey impurity. His success necessarily stimulated inquiry as to its explanation. Previously, Semmelweis, whom his inappreciative countrymen had hunted from city to town, had noticed the contagiousness of puerperal fever, and had pointed out how it was conveyed from one woman to another by septic obstetricians. Then Simpson wrote his memorable paper on "Hospitalism," to which Holmes replied with his able but not convincing rejoinder. The German bacteriologists furnished fresh information on the subject, and Lister followed with his world-renowned theory and system of aseptic treatment. Allowing for all the undoubted progress which Listerism has brought, it may yet be asked:—Does its secret consist only in cleanliness and dependent openings; or have the gauze and the spray imparted some new power to surgery? I am indeed of two frames of mind. When I read of the triumphs of Tait and of the wound treatment of Gamgee, I am disposed to hold that the nail brush and the tubing are the real factors of success; but when old memories revive, and I recall the hectic with his flushed face, bed-eaten skin, and pus-sweating ulcers, I feel that there is really something in the system, though not nearly so much as its enthusiasts believe.

Leaving hygiene, and coming more to modern surgery, and especially that part of it which appertains to our own land, we find that Australian surgery possesses two peculiar features:—firstly, the prevalence of hydatid disease; and secondly, the absence of rachitis.

The frequency of hydatid confuses and complicates the diagnosis of every tumour; every deep-seated pain may have reference to it; and in persons of suitable age, the cicatrix of an old hydatid not infrequently becomes the seat of carcinomatous growth. A man consults me with a swelling in the groin, apparently unmistakable psoas abscess, though the seat of the bone lesion is obscure; I incise it, and out flows hydatid fluid. Again, I am called to attend what seems a severe tibial osteitis; operation reveals a parasitic cyst. Once more, I tap a hydatid tumour in an adult of 50; a year passes, I am invited to visit him at his house, and a cursory inspection at once discloses disseminated carcinoma of the liver.

Another feature which strikes a surgeon in Australia is the almost total absence of deformities due to inheritance or vicious osseous nutrition. A student may go through the whole of his curriculum without witnessing a genuine case of rickets, the beaded ribs and bowed legs being almost unknown in our wards. MacEwen, in

Glasgow, a town whose population is not greater than that of Victoria, records his thousandth operation for genu valgum. I venture to say that if the whole of our colony was searched not five cases suitable for operation would be found. Any observant person walking down one of our side streets, and subsequently through a by-lane in a European city, will at once notice the difference. In the latter he will encounter mis-shapen, distorted little wretches, with enlarged heads, depressed noses and curved backs, with bent limbs and legs, all over the place. On the other hand, look at the Australian child, even emerging from the lowest den—he is straight-limbed and level-featured; a neglected club-foot may possibly be met with, and occasionally one runs against a “Boiteux” from chronic hip disease, but rachitis and bone distortions, arising from other causes than fracture, are almost unknown.

Although we rarely find occasion for osteotomy, the tendons, bones, and joints furnish us with an abundant and most attractive field for practical work. The tenotome is an instrument for which I early conceived a great predilection. Its employment in subcutaneous surgery is so neat and clean, so destitute of danger, so manifold in its applications, that I marvel how little use is generally made of it. While the division of tendons is commonly performed to remedy chronic deformity of joints, it is too often neglected in oblique and complicated fractures, and many dislocations which have not been reduced at the outset are improperly regarded as incurable. In the Melbourne Hospital I have succeeded in reducing luxations of the hip of six and seven months' standing by simple manipulation, after freely dividing the capsule and the tendons of all contracted muscles. The tenotome should also play an important part in the treatment of joint mischief, whether acute or chronic. Thus, in acute synovitis of the hip, with copious effusion, evil must result if the tension within the joint is not speedily relieved; the ligaments soon become softened and elongated, losing their elasticity, so that repair is difficult; and if, after a long lapse of time, recovery does take place, too often the swollen tissues undergo contraction, and almost irremediable deformity remains. Such mischief may be prevented by freely dividing the capsule subcutaneously behind the trochanter, thus allowing the contents of the joint to diffuse into the connective tissues around, at once relieving the ligaments from tension, and preventing re-accumulation of inflammatory products. The fine trocar, so often recommended, certainly gives relief, but often of merely temporary character, as the little opening is apt to close at once, thus necessitating a repetition of the operation. In another class of cases—unfortunately too frequent—an acute or sub-

acute synovitis of the knee joint is neglected; the fluid originally effused is slowly absorbed, but the articular and peri-articular tissues remain thickened, the joint is largely disabled, and accessions of pain and swelling occur after any exertion. Here again the tenotome renders signal service. By freely dividing subcutaneously the fibrous structures around the joint we permit fluid to diffuse from one layer into another, and thus facilitate absorption in a very marked manner. Everyone must be familiar with such cases, and must recognise how slow and imperfect is the process of repair under the usual course of treatment.

The rapid recovery after free use of the tenotome affords a most grateful contrast. Cases even more serious, such as those in which chronic synovitis is leading on to pulpy degeneration, are only one degree less amenable to similar treatment. Here the synovial membrane is becoming swollen, spongy, and friable, rich in cells but poor in vessels, and tends to spread over and erode the cartilaginous surfaces. Absorption is almost at a standstill; the tissues are sodden, inelastic, with little or no power of contraction or repair, but, on the other hand, with a decided tendency to break down or to become the seat of a local tubercular process. Under these circumstances the tenotome should be used more freely, so as completely to divide the synovial membrane in various places, thus encouraging the swollen tissues to empty themselves of fluid, and allowing the lymphatics around the joint to contribute to the progress of absorption. Such measures will not infrequently give material aid in avoiding the necessity for excision.

If we turn for a moment to the treatment of osteitis—a subject so intimately connected with joint disease—the tenotome will still be found of service, but mainly as an adjuvant to subcutaneous drilling of the bone. In acute osteitis, apart from septic infection, two great dangers must be faced—those resulting from tension of inflammatory products pent up within the rigid tissues of the bone, and those arising from the tendency to implication of an adjacent joint. Both these risks may be largely removed by the free use of the drill; but I must remind you that the opening made by the drill should be strictly subcutaneous. Valvular passages to the bone must first be made with a tenotome, and then the drill may be employed to almost any extent without fear. Epiphysial cartilages should be avoided, although their perforation by a drill does not, as a rule, cause any mischief. Unless pus has already formed, the drill is infinitely superior to the trephine in the treatment of acute inflammation of bone.

In chronic osteitis, whether rarefying or plastic, the trephine

should not be used. The affected part should be drilled in different directions, so as to permit escape of the inflammatory exudation from the bone, the lymphatics of the periosteum and of the tissues around then coming actively into play. The great trochanter and the inferior epiphysis of the femur, the peri-articular portions of the os innominatum, the upper end of the tibia, the os calcis, and other bones may be cited as parts whose inflammatory processes are more easily controlled by drilling than by any other surgical procedure. But the same method may be applied to the smaller bones, as of the carpus or tarsus. Here osteitis not infrequently commences in subacute fashion, in some one bone in particular. If it is neglected the whole series of carpal or tarsal joints may be implicated, but such bones, when affected singly or in groups, may be drilled freely without fear, and with excellent results. Cartilages should not be perforated unless necessary, although such perforation, when effected by subcutaneous drilling, produces little or no harm.

It may be thought that these statements are rather bold, but after constant trial of these methods during the last sixteen years, I can confidently recommend them as having with me been almost uniformly successful. Perhaps your patience will not be wearied if I quote, very shortly, a few cases illustrating the practice I have just described.

Mr. M. H., æt. 37, called on me on August 10, 1886. He had been under treatment for two years for inflammation of the knee joint, and explained that he was unable to bend the leg or make any use of it without severe pain. On examination I found great thickening all round the joint, the synovial membrane being much thickened and œdematous, the patella seeming to be embedded in inflammatory products and partially fixed. Deep pressure on either side of the knee-cap caused great pain, and the motions of the joint were extremely limited. Dr. Meyer administered chloroform, and I subcutaneously sliced the synovial membrane and the fibrous structures around it in several places, in fact, all over the joint. The limb was placed on a posterior splint, and slight extension applied. Small doses of grey powder were ordered twice daily, and as there was subsequent swelling of the joint, hot fomentations were applied. At the expiration of three weeks the splint was removed, and passive motion tried, with massage. The patient rapidly recovered, and has now complete use of the joint. In the Melbourne Hospital I have successfully treated many cases of pulpy synovitis by similar methods.

Early in January this year Dr. Bird asked me to see a lady with him in consultation. Mrs. C., æt. 29, rather a delicate-looking woman, has had two children, youngest two years old. She stated

that she suffered intensely from intermittent pain in the right hip, which was worse at night, or after any exertion. She described it as a burning aching pain, and said that she got most relief by abducting the limb, and supporting the knee on a pillow. On examination, the great trochanter and neck of the right femur were found much enlarged and painful, especially on deep pressure. There was slight effusion in the joint, and the limb could not be brought straight without causing lordosis. She was of course very lame. All ordinary means were tried without avail, viz., leeching, iodide of potassium, sedative liniments, rest, &c. As she was getting worse, I decided to drill the trochanter, neck, and head of the femur. Dr. Bird administered chloroform, and I put in six drills obliquely, making first an incision with a tenotome, and following it up with a long drill right into the cancellous structures of the bone, the operation being so conducted that no air could be possibly admitted. The case progressed so favourably that she was able to attend her sister's wedding three weeks after the operation, and she is now in perfect health, free from pain, and walks without the slightest limp.

I do not wish to be tedious, but allow me to mention one case more, illustrating the lasting effects of drilling in sub-acute osteitis. Some six years ago Mr. N., an Inspector in one of the Banks, called on me and gave the following history:—For nearly a year he had suffered from intermittent pain in the right tibia, always more severe at night; in fact, he was seldom or never free from pain, which, during the last four months, had greatly interfered with his rest. The periosteum had been freely divided by a surgeon, with temporary relief, but the old pains returned immediately on the wound healing. In my own room, and without chloroform, I subcutaneously drilled right through the tibia. He was away from the office for two days only, but suffered pain for some little time after the operation. This soon left him, and I saw Mr. N. the other day looking the picture of health, and he told me that he had not the slightest return of the old trouble.

I could relate several other instances of a similar nature where I have used the drill, but to do so would consume too much time. I am confident that experience will prove the great utility of this instrument.

Another subcutaneous procedure which I have practised for many years with success, not unvarying, but still constant enough to warrant my warmly recommending its adoption, is the wiring of the pillars of the inguinal canal, for the radical cure of hernia. At the end of 1883, I published in the *British Medical Journal* a

description of this operation. I will not take up your time by entering upon its details again, but I see by the home journals that the operation has been frequently performed and favourably spoken of. I have never had an opportunity of examining, post-mortem, the pillars of a wired canal, but one of my colleagues in the Melbourne Hospital has just related to me the following case:—Whilst I was travelling in Europe, a young man was admitted into one of my wards, with a scrotal swelling of some considerable size. The tumour, as it had developed suddenly, apparently after a blow, seemed to be a simple hæmatocele and was diagnosed as such, but as I had operated on the man some three years previously, and as the patient insisted that his hernia had descended, it was determined, on consultation, to open the scrotum and explore its contents. It was found that the tumour consisted merely, as was suspected, of a clot; the bowel had never come down; the ring was firmly closed, the caging wires could easily be felt, and the cure had been absolutely complete.

I can assert, without any reservation, that this operation is quite free from danger; that it has been completely successful in my hands, and that it is tolerably easy to perform after a little practise.

There are other applications and methods of subcutaneous surgery on which I would like to dwell, but as I have some intention of bringing my views forward in a more extended form, and as the time during which I may engross your attention is rapidly drawing to a close, I will pass on to a short review of some of my recent experiences at the other side of the world.

During my stay in Europe, whither I recently went to re-visit the scenes of my younger days, it was my good fortune and great pleasure to meet many of those illustrious men who do honour to our common brotherhood, and whose names are held in respect throughout all the civilized world. Of their personal kindness to me I can never say too much; but the gratification this attention afforded me was the greater, from the knowledge that it was, in some degree, a recognition of the medical profession on this side of the globe. I was present, in 1884, at the Medical Congress in Copenhagen, as the representative of Victoria, and as I listened to the address of Sir James Paget, whose name at once recalls his splendid contributions to surgical science, I felt that it was indeed a good thing to belong to the great federation of medicine. Among the many interesting papers read, were two by Esmarch, whose name is now high on the roll of great surgeons. One was on permanent antiseptic dressings, and the other on rectectomy for carcinoma. Sayre in his rough and ready style applied his plaster jacket to a

little patient in our presence. Bryant read notes on colotomy in rectal disease; but, in the animated discussion which followed, the representatives of the French School of Surgery spoke strongly against the operation, advocating rectectomy in preference, a view which was shared by most of the Germans and by many of our own countrymen. I may remark that I have on several occasions performed rectectomy with gratifying results, and that in my opinion colotomy should be restricted to very exceptional cases. One of the papers which chiefly attracted my attention was that by MacEwen on osteotomy; but, as already mentioned, little opportunity of practising the operation is given us in these colonies.

At a later period, I witnessed some rather startling surgery in Russia. In company with Sir James Paget, I was taken by Dr. Rheier to the Military Hospital at St. Petersburg, where I saw seven cases of laryngeotomy, each patient being fitted with an artificial larynx. I must confess that the tests in the direction of vocal utterance were not an absolute success. In fact, the results were in a measure grotesque. Possibly my non-acquaintance with the Russian language had something to do with the apparently absurd attempts at articulation, and, perhaps, what appeared to me only a squeak, was very good Russian. At any rate, there was a uniformity in the sounds; the patients all squeaked the same note, and it was by no means euphonious. Dr. Rheier exhibited, also, a number of children upon whom resection had been performed, variously in the hip, knee, and elbow; and he explained that, although in some of the cases he had removed large portions of bone, he had not found that the growth of the limb was thereby checked. I could not, however, quite gather if, in these resections, he had touched the epiphysial cartilage, or had gone beyond it.

With reference to Continental surgery generally, I deliberately formed the proud conviction that the surgeons of the Old Country still decidedly hold their own. I had the pleasure of seeing Mr. Christopher Heath operate on a case of disease of the jaw, and was delighted with the brilliancy and precision of his work. Sir Henry Thompson's lithotrity cases, of which I witnessed a good many, interested me strongly. Nor shall I soon forget the excellent surgery exhibited by that distinguished veteran, Mr. Savory, who showed me many patients treated without the cumbrous precautions of Listerian asepticism, but with that perfection of cleanly surgery of which Mr. Savory is so able an exponent. I would be the last to deny to Professor Lister any of the credit so fully due to him for his admirable investigations, and for the impetus which he has given to the observance of scientific cleanliness in surgical practice. But

I hold, with many others, that the secrets of antiseptic surgery have yet to be revealed, and that in the meantime too much is made of processes which are unnecessarily cumbrous.

In the course of a visit to Dublin, after an absence of 27 years, I met again my old teacher, Butcher, to my mind the pride of the Irish school of modern surgery. I can never forget his brilliant lithotomies, knee-joint resections, and many other operations which have justly made his name famous. Mr. Butcher's now failing health prevents further active work; but the reputation of the Irish school still holds its own, as there are several eminent surgeons in Dublin who fully uphold the high position it has up to the present justly maintained.

Coming back to the home of my adoption, I am pleased to believe that here in Australasia we are not wanting in the pursuit of science. We have careful inquirers, and bold and skilful operators. It would be invidious for me to single out any names for special mention, but I must take this opportunity of congratulating my confrères of Adelaide on the scientific spirit which animates them, on the value of their published researches, and on the brilliancy of their practical surgery.

And now let me say how hopeful this Congress makes me of the future of our great brotherhood, and how confident I am in the belief that we shall be one united body all through this Southern commonwealth. Our labours may be divided, but our common work all tends to unity. So that whether we be physicians or surgeons, or sub-divisional specialists, we have all one common end in view—the lessening of human suffering, and the consequent promotion of the happiness of our fellow-creatures.

The PRESIDENT (Dr. Verco)—It is interesting for us to see how the different gentlemen who have given us addresses seem to have impressed themselves in the papers they have read to us. We know Dr. Williams and Mr. Fitzgerald by repute, and after hearing their papers we seem to see the men in them. We have to-day the outcome of an enormous surgical experience, and I think we may make bold to say that we shall be able to read this address on general surgery time and again, before we derive all the benefit it will be possible to obtain from it. We can also bear the writer out in some of his remarks from facts which come under our own notice. For instance, it is everybody's experience who has been in the old country and practised in this, how exceedingly uncommon those diseases which belong to the ricketty class are here. It is only very occasionally that you meet with such cases in this country. If there is a worker amongst us who wants to have something on which he can spend a good deal of time with a good result to the profession and the community, let him see how it is that we have so many children in these

colonies troubled with hip joint and scrofulous diseases, and so few are troubled with rickety complaints. There is some secret reason for this that we have not yet discovered. I am almost sorry that there are not more sections, and not more addresses. We ought to have another section of therapeutics, and see what advance has been made in that branch of medical science. It is interesting to note too the advance in the length of life during the last fifty years. Fifty years ago, thirty years was the average length of life in Great Britain, and now it stands at thirty-eight, showing that operators have become more bold, and other practitioners more perfect in their branches of the science of medicine.

REMOVAL OF A LARGE URIC ACID CALCULUS, WITH PHOSPHATIC COVERING, BY PETERSEN'S SUPRAPUBIC OPERATION.

[By H. WIDENHAM MAUNSELL, M.D., Trinity College, Dublin,
Honorary Surgeon Dunedin Hospital.]

Duncan Keir, aged 56, married, labourer. Born in Glasgow; residing in Dunedin. Admitted into the Hospital on 10th June, 1887, suffering from bleeding internal piles. The piles have been very painful, and bleeding on and off for the last three years. Since then he has done no work. Eighteen months ago he was operated on for a growth in the rectum.

16th.—Complains of great pain in the anus when the bowels are moved. A small fissure was discovered and divided at the posterior border of the anus.

1st July.—Still complains of violent pain in rectum. On examination with the finger a very large and hard substance was discovered in the bladder, which was at once suspected to be a stone. A sound was passed under chloroform, and the presence of a very large calculus ascertained to a certainty.

7th July.—The bowels were well moved with castor oil last night, and the rectum washed out with an enema this morning. The pubes was shaved and washed with carbolic lotion.

OPERATION.—Chloroform having been administered, a catheter was passed, and the bladder washed out, and then distended with six ounces of boro-glycerine and water.

A Barnes' rubber bag was now oiled and passed up the rectum, and gradually distended with 16 ounces of water, when the stop-cock was turned. The upper and anterior surface of the bladder

could be seen and felt fully four and a half to five inches above the pubes.

With one or two strokes of the knife I made a longitudinal incision, four inches long in the median line, down to the pubes. All bleeding points were at once arrested, and the bladder laid perfectly bare by lifting the peritoneum from below upwards with the finger. As soon as the bladder was well exposed, it was seized on either side with catch-forceps, and an incision was made between the two foreceps sufficiently large to admit the finger. This opening was gradually dilated with a lithotomy forceps, but the calculus was so large that it could not be extracted without partly separating the rectus muscle from its attachment to the os pubis on either side. In removing the calculus, its outer phosphatic coating—fully half an inch thick all round—was smashed off, leaving the hard central uric acid calculus.

The rubber ligature having been removed from the penis, a catheter was inserted, and the bladder thoroughly washed out with warm water. A drainage-tube, nearly half an inch in diameter, was now introduced into the bladder above the pubes, and fixed with a double horsehair ligature, and the upper third of the abdominal wound was sewn up. The drainage-tube and the wound were packed round with iodoform and tow. A long tube was now connected with the end of the drainage-tube, so as to conduct the urine clear of the bed into a vessel beneath.

8th.—Had considerable pain last night. Water passes freely through the tube. Dressed as formerly every four or five hours.

9th.—Has little or no pain. Says he is easier now than he has been for years. Wound looks remarkably well.

11th.—Catheter passed, and bladder washed out through the urethra with boracic lotion. Drainage-tube removed.

13th.—Passed all his water per urethram to-day.

15th.—Has two or three bed-sores. Ordered to get up and sit in arm-chair.

August 7th.—This man is perfectly well now. External wound almost entirely healed up.

It was the study of Pirogoff's Great Atlas of Plates, and Garson's Casts and Drawings, showing the relative position of the peritoneum when the bladder and rectum were empty and when distended, that suggested to Professor Petersen, of Kiel, the advantage of the supra-pubic operation.

In these sections the bladder has been lifted into the abdominal cavity by distending the rectum, the prostatic and membranous portion of the urethra being elongated to a remarkable degree.

COMPLETE EXCISION OF THE LARYNX.

[By WM. GARDNER, M.D., C.M., Surgeon to Adelaide Hospital,
Lecturer on Surgery, University of Adelaide, South Australia.]

In the *Lancet* of May 7th, 1887, I published the notes of a case of excision of the larynx for epithelioma, and owing to the death of the patient I am able now to lay before you a complete account of the case with full notes of the post-mortem examination, for which I am indebted to my friend Professor Watson, of the Adelaide University.

The history, for which I am indebted to my Assistant Surgeon in the Adelaide Hospital (Dr. Anstey Giles), is as follows:—

James M——, æt. 60, shoemaker, living in a small suburb of Adelaide, was sent to me by my friend Mr. Corbin, as a probable case of malignant disease of the larynx, with a request that I would examine him and do what I could to rid him of his trouble. On Oct. 9th, 1886, I admitted him to a private hospital. The patient has been a healthy man all his life, and has never suffered in any way except from an occasional cold. He has always been engaged in the same trade, and has not suffered from syphilis, or been exposed to hardships of any kind.

His father died at the age of 80, and his mother at 40. He does not know the cause of death in either case. His grandmother (paternal) died at the age of 90. There has been no disease of an hereditary nature in the family. Two years ago he lost his voice, and it has never returned. Previous to losing his voice he suffered from no throat affection of any kind. The voice gradually became weaker, till at the end of four months he could not speak above a whisper. He continued in this state until four months ago, when he began to experience a sharp gnawing pain over the larynx, for which he was treated in various ways, but without the least improvement in the conditions. He has had a long course of iodide of potassium with no result. With the increase of pain he has been rapidly losing flesh, feeling very weak, and during the whole period (four months) has been unable to rest at night on account of the pain, which wakes him up continually. He never had any night sweats, can take food fairly well, and swallowing causes slight pain. There is no absolute aphonia.

On laryngoscopic examination, both the vocal cords were found to be ulcerated away in nearly their entire length. Irregular white papillomatous nodules were projecting into the centre of the larynx from the sides immediately below the glottis. The false cords and the mucous membrane above were very much inflamed, and bulged out

by solid growth underneath, more marked on the right side than on the left. Arytenoid cartilages not swollen or abnormally red; posterior commissure not thickened. The epiglottis was quite free from the growth, and there was no sign of any disease above the larynx. There was nothing abnormal to be felt externally in the neck, and the glands were not enlarged. The larynx was quite free and moveable, but some pain was caused when it was pressed between the fingers. A small piece of the growth was removed with laryngeal forceps, and sent to Professor Watson, who very kindly examined it, and pronounced it to be a 'cornifying epithelioma.' On examining the lungs the chest was seen to be barrel-shaped. All over the front and back of the right lung the percussion note was fairly resonant. Over the left lung hyper-resonance was observed. No increase in the vocal fremitus. Respiration harsher than normal all over the chest, and expiration prolonged; more marked on the right side than on the left. No râles, rhonchi, or accompanying sounds to be heard. Vocal resonance normal; heart sounds normal; pulse slow, full, and regular; arteries not atheromatous. The urine contained neither sugar nor albumen.

On October 12, at 3.30 p.m., the following operation was performed:—The patient having been placed under the influence of chloroform, the whole anterior part of the larynx was exposed by making a free incision from the hyoid bone to a point immediately below the second ring of the trachea. The anterior jugular veins were tied in two places, and divided between the ligatures, as they interfered with a free dissection. The muscles attached to the side of the thyroid cartilage were thoroughly separated as far back as possible, and the fascia attached to its upper edge was set free without dividing the thyro-hyoid membrane. The hæmorrhage was troublesome and very free, the bleeding from the crico-thyroid artery being very difficult to arrest. Every bleeding point was carefully ligatured, and pressure with hot sponges gradually reduced the oozing. The trachea was opened between the cricoid cartilage and its first ring, and a well-fitting tube made of lead was at once inserted into the trachea, which effectually prevented blood from entering the lung. A flexible rubber tube, about ten inches long, was attached to this, and the administration of chloroform was continued through it. Then, principally with the handle of my knife, I separated the larynx from the œsophagus, divided the superior cornua of the thyroid cartilage, cut through the thyro-hyoid membrane, and finally divided the superior and posterior attachments of the larynx as close to the cartilages as possible, with a pair of scissors, the epiglottis being cut through at its base. The

superior thyroid arteries bled profusely, but were at once taken up and ligatured. The patient took the anæsthetic easily, bore the operation well, and showed no signs of collapse. As far as possible throughout the operation the parts were separated by working with the handle of the knife. All bleeding points were ligatured with chromicised wallaby tendons, which make most excellent ligatures, being strong, safe, and easy to apply. The wound was dusted over with iodoform, and covered with absorbent cotton-wool. The tube was securely tied in with tapes round the neck and under the axillæ.

6.30 *p.m.*.—Slight oozing of blood-stained saliva from the wound above the tube.

8 *p.m.*.—An enema of beef-tea and brandy was administered, and carbolic acid spray used for five minutes in the room. Temperature, 98° F.

9.40 *p.m.*.—One-sixth of a grain of morphia injected hypodermically.

12 *p.m.*.—Enema of beef-tea and brandy given. Carbolic acid spray used in the room.

October 13th..—Ordered an enema of beef-tea and brandy every four hours; carbolic acid spray also used in the room. Temp., 98.6° F.; pulse, 88; respiration, 28. Slept well through the night; slight cough. Wound dressed with absorbent cotton wool, dusted with iodoform, placed above and below the tube. A piece of carbolised gauze was placed over the orifice of the tube and the patient raised to a sitting posture. No oozing from the wound. Chest-sounds over bases of lungs normal.

4 *p.m.*.—A small red rubber catheter was passed down the œsophagus from the wound in the throat, and through a glass funnel about a pint of milk and lime-water was allowed to flow into the stomach.

9.30 *p.m.*.—Temp., 98.6° F.; pulse, 80; respiration, 28.

October 14th..—Feeding by the œsophageal tube was continued, and also the enemata of beef-tea and brandy. The tube was not kept in situ, but was easily introduced each time that it was considered necessary to feed the patient. Temperature, 98.4°; respiration, 21; pulse, 92. Skin cool and moist; no pain. Lungs resonant all over back and front; breath-sounds normal. Great quantities of saliva running from the wound. Wound dressed with iodoform and absorbent cotton-wool. Tube keeps in good position and causes no irritation.

3 *p.m.*.—A pint of milk with brandy and lime-water passed into the stomach through the œsophageal tube caused slight vomiting, and some feeling of discomfort. Half the quantity was ordered to be given at a time for the future. Cough troublesome.

9 p.m.—Temperature, 98.4°; pulse, 84; respiration, 22.

October 15th.—Slept well throughout the night; cough easier. Temperature, 98°; pulse, 80; respiration, 24.

2.45 p.m.—Leaden tube replaced by a silver one of similar shape but rather larger calibre.

9 p.m.—Complains of thirst. Lemon-water given to rinse out the mouth.

October 16th.—Slept fairly well; cough rather troublesome. A quantity of thick phlegm was expectorated. Temperature, 98°; pulse, 80; respiration, 18. Wound almost healed above. Copious flow of saliva.

From this date to the 19th the treatment was just the same, and the temperature continued normal, with diminished cough and lessened expectoration of phlegm. The little finger was passed every other day upwards as far as the base of the epiglottis to keep the way open for the insertion of the upper tube of the artificial larynx afterwards. On December 3rd the patient was discharged, and returned to his own home, wearing only the lower tube of an artificial apparatus, which had been made from the wood-cut in the *Lancet*, as used by the late Dr. Foulis, of Glasgow, and modified from Gussenbauer's original apparatus by Dr. Irvine. In this case, however, the straight tube could not be inserted, and I had the upper one altered so as to assimilate it to Gussenbauer's original apparatus.

On January 17th, 1887, the man re-entered the private hospital, and, under chloroform, the upper wound was reopened sufficiently to admit the upper tube, and then the lower tube was passed through it, and the whole tied in with tapes round the neck. The reed used was made of platinum, and, although the note was rather trumpet-like, his words could be distinctly understood on his awakening from the anæsthetic. After the insertion of the upper tube, liquids were found to run down whenever he drank, and recourse was had to the soft rubber tube, which was passed down the œsophagus several times a day for feeding purposes. Examination with the laryngoscope showed the silver tube appearing just below the epiglottis, which was very œdematous. Tannic acid spray was ordered, and no examination was made until the end of the month, when it was discovered that there was a small new growth on the anterior pillar of the fauces low down, with a small amount of glandular enlargement of the neck on the same side. As it was evident that the disease had returned, it was decided to remove the upper tube, to prevent any irritation, and, as the epiglottis was not acting, to enable him to take food again by the mouth by allowing the upper wound to heal, which it did very rapidly; and on February 5th, being able to take both

liquids and solids well, he was sent home again. On the morning of February 11th I again saw the patient, and the growth had increased markedly. He was wearing a tube which I had constructed of silver, like a tracheotomy tube, but with a more abrupt dip into the trachea. This he found exceedingly comfortable, and all he complained of was pain in the right ear. He seemed thoroughly well nourished, and expressed gratitude for the temporary relief afforded him. The new growth gradually increased, and the patient's power of taking nourishment became less, and he gradually sank, with very little pain, on July 9th, 1887.

Post-mortem report from notes kindly supplied by Professor Watson:—"The uppermost ring of the trachea, together with the sclerosed remains of the isthmus of the thyroid gland, was adherent to the skin at the lower part of the artificial opening, of which the borders were formed by a cicatricial blending of skin with subjacent muscular and fascial planes. The free border of pharyngo-tracheal septum produced by the operation was occupied by a fungating growth, continuous above on the right side, with a vast and sloughy ulcer, which had destroyed the right posterior pillar of the fauces and tonsil, and also the right half of the epiglottis and glosso-epiglottic fossa, where at some distance behind the papillæ circumvalatæ its edge was abruptly thrown up, and a microscopic section from this part showed the same characteristic epithelial buds noticed in the portion of tumour originally removed (nine months ago) from the tracheal surface of the right vocal cord. The ascending pharyngeal artery and the trunk of the super-thyroid artery (in this case arising from the common carotid artery) and the lingual arteries, as well as the greater part of the styloid process and the whole of the greater cornu of the hyoid bone, lay exposed and necrotic where the muscular planes of the pharynx had been eaten through. The left half of the epiglottis hung loosely into the lumen of the pharynx. The external carotid artery, although not exposed, was much contracted, but neither it nor the internal carotid, nor the internal jugular vein, were plugged. Some of the lymphatic glands about the angle of the jaw on the right side were moderately enlarged, but not adherent to surrounding structures. The parotid on the same side was inflamed, but not suppurating. It showed also no indication of cancerous deposit. The lungs were emphysematous, with pronounced pigmentation and correspondingly inky bronchial glands, which latter were otherwise unaffected. Both apices presented some arachnoid-like pleural adhesions. In addition, the right apex showed a white cartilaginous patch of thickening of its pleura as large as a shilling, which under the microscope presented a laminated fi-

brillar structure, containing granules of black pigment towards its deep surface, but no signs of nucleation. In the interpleural space of the superior mediastinum there was a lobulated fatty tumour flattened out between the origins of the sterno-mastoid muscles in front and the left innominate vein and the trachea behind. It ascended some distance into the neck between the innominate and left common carotid arteries overlapping the trachea at the sides. The heart and the arch of the aorta were healthy. The mediastina showed no signs of cancerous deposit. The abdominal viscera, examined through an incision in the diaphragm presented nothing pathological."

Remarks by Prof. Watson.—"Death was evidently due to exhaustion, consequent on starvation, pain, and absorption from the ulcerated surface of the new growth, which appears to have spread upwards *per continuitatem* from a local recidive, rather than to have been a downward spread from a secondary deposit in the tonsil. The lipoma was of interest both from its situation and its contrast with the extreme emaciation of the rest of the cadaver. The question would naturally present itself as to how far, if at all, any of the *intra vitam* symptoms might be referred to its presence in the neighbourhood of the trachea and great vessels and nerves. Or it might be asked whether the tumour itself was not the outcome of a fatty substitution of the areolar tissue of the part following in some obscure manner on the removal of the larynx."

REMARKS.—The points worthy of notice in the method of operation were—(1) That the larynx was removed from below upwards. (2) That immediately that the trachea was divided and separated from the œsophagus a tube of rectangular form having the full diameter of the normal larynx, was inserted into the trachea, and most effectually prevented the entrance of blood. (3) The great advantage of the "hanging head" position in lessening the risk of blood entering the trachea.

The operation was performed for intrinsic cancer of the larynx, the presence of which was demonstrated by removing small piece of the growth with intra-laryngeal forceps, and there was not the least sign of any enlarged glands in the neck. One would naturally have expected a much longer immunity from recurrence than actually occurred; however, the probability is that the patient had been suffering from the disease for two years. Had the diagnosis been made at an earlier period of the case, we may reasonably conclude that the rapidity of recurrence would have been correspondingly lessened. If we may not hope for earlier diagnosis, then I venture to express the opinion that we can hardly advise any patient to undergo so formidable an operation as extirpation of the larynx, when in this case,

where there was nothing to point to an extension of the disease beyond the confines of the larynx, the disease appeared in the tonsil three months after the operation. Our efforts must be directed towards reducing the mortality of the operation—which is now over 40 per cent.—and then we shall be enabled to give our patients the chance afforded by an early excision of prolonging life, and removing, for a time at least, the cough and dysphagia. At present the great mortality prevents many surgeons from advising a patient to take the risk. Early recognition of the disease allows of its removal by a partial resection, which is much less fatal than a complete one.

“Dr. J. Baratoux has collected 102 cases, of which five were too indefinite for analysis. Of the 97, 14 were partial, 83 complete. Of the former there were eight recoveries and six deaths; of the latter, 24 recoveries, 58 deaths, and one result unknown. Among the recoveries are included five laryngectomies of less than two months’ standing for carcinoma. Leaving these five out of consideration, there have been 47 deaths in epithelioma cases, and 15 recoveries, if patients surviving from two months to a year may be counted as examples of recovery. One-third of the whole succumbed during the first week to shock, exhaustion, pleurisy, pulmonary embolism, hæmorrhage (two), collapse (three), or pneumonia (11). One-fifth of the survivors succumbed before the end of the first month, six of them by pneumonia; and before the end of the fifth month more than one-third of the remaining survivors had succumbed.”—*International Journal of the Medical Sciences*.

Truly these statistics are not encouraging, yet I feel sure that by improved methods of operating, surgeons will be able to give a very different account of the death-rate in the next hundred cases.

I cannot conclude this short paper without drawing attention to the excellent vocal apparatus constructed for me by Mr. Boettger, of Flinders-street.

To Drs. Newman and Woodburn, of Glasgow, I am indebted for information concerning Dr. Foulis’ original apparatus, and Dr. Woodburn has constructed in vulcanite a model of it for me, and forwarded it by a friend of mine, who has not yet returned to Australia. Should any member of this Congress meet with a similar case, all the appliances I have will be gladly placed at his disposal.

HYDRONEPHROSIS: REMOVAL OF KIDNEY: RECOVERY.

UNDER THE CARE OF WALTER FELL, M.B., OXON., WELLINGTON,
NEW ZEALAND.

Mrs. T., aged 31; married; six children.

First seen by me in June, 1886. Her history then was, that for the last four months she had had periodic attacks of intense pain in the right lumbar and hypochondriac regions; catamenia regular and nearly-painless.

On examination there was an evident hard body, about the size of the kidney, situated in the right flank just below the last rib, and moveable to such an extent that I could push it forward to the umbilicus. It was diagnosed to be a moveable kidney, and she was recommended a pad and bandage to keep it in place.

September 1st I was sent for again, not having seen her in the interval. She told me she had had so much pain, and the attacks were becoming so much more frequent, that she thought she would go out of her mind if not relieved. She had just gone through two days of intense pain and incessant retching and vomiting. The least exertion seemed to bring on an attack. There was no rise of temperature. Urine pale, clear; no albumen. On examining the abdomen, the same moveable tumour could be felt as before, but now it was much larger, came forward as far as the umbilicus, and was distinctly lobulated; the anterior part fluctuated; the uterus was pushed forward; length normal, free from the tumour, which also appeared to be unconnected with liver. The patient had emaciated considerably since I saw her last, and her face had an anxious worn expression. When I suggested an operation she readily gave her consent, saying she would rather die than go on in so much pain.

On the next day but one on seeing the patient, I found her laughing and free from pain, and on examining the abdomen the tumour had completely disappeared; the kidney could still be felt a little in front of its usual position, but the fluctuating swelling, reaching to the umbilicus, was gone. This, she told me, was always the case:—"When the pain was bad the lump was there; when the lump went she was as well as ever again." This appeared to confirm the diagnosis. The only explanation possible was that the ureter got blocked for some reason or other, the pelvis of the kidney enormously dilated, and pain and vomiting followed, only to be relieved by the obstruction yielding and the tumour emptying itself. There was no blood or foreign substance in the urine. It seemed to me that unless something was done to relieve her she ran considerable

risk of rupture taking place of the thinned and dilated pelvis of the kidney during one of the paroxysms of pain.

On September 5, 1886, assisted by Dr. Collins, with Dr. Rawson giving chloroform, I proceeded to operate, full antiseptic precautions being used.

An incision was made about four inches long in the ordinary position for right lumbar eolotomy, but carried a little more forward than usual; on getting through the abdominal wall the first thing that came into view was the edge of the liver, and immediately below this the kidney. On passing the hand cautiously forward towards the umbilicus, a large bag containing fluid was made out; it was evidently a part of the kidney, and pressure on it reduced its bulk somewhat. The cyst being thus partially emptied, a finger could, by invaginating it, get into the centre of the kidney, so that with the thumb outside it was possible to make out that the substance of the kidney proper was greatly reduced, it was in fact being slowly converted into a large cyst. After a brief consultation it was decided that the kidney was useless and a source of danger, and had better be removed. Accordingly, as it was bound down tightly by its lower surface, I cut into and stripped off the capsule of the kidney which was adherent in parts, shelled out the kidney, and then with some difficulty, tearing away a lot of loose areolar tissue, I was able to get hold of the large mass of vessels, ureter, connective tissue, and mesentery, which constituted the pedicle, and transfix it and tie it. After removing the tumour, smart bleeding took place from some unsecured vessel in the upper part of the wound, and deep inside. Only a few seconds elapsed before the artery was secured with forceps, but the loss of blood was sufficient to cause an alarming condition of collapse in the patient. A stout double silk ligature was tied round the entire stump of the pedicle, and the ends cut short. The wound was sponged and closed as rapidly as possible.

The operation took a little over an hour. The patient sustained a very severe shock, and for some hours I felt doubtful if she would rally. Towards evening reaction set in, and from that time she made an uninterrupted recovery. Her temperature never rose above 99° F., and on the fourth day was normal all day.

On the 22nd she got up. She had then put on flesh, and looked better than before the operation.

From that time to now, August, 1887 (nearly a year), she has continued in splendid health, free from pain, and apparently suffering no inconvenience from the loss of the organ.

On examining the kidney after removal no cause for the occlusion of the ureter could be found, other than that, owing to displacement,

the kidney partially turned on itself, and so twisted and blocked the tube. The lumen of the ureter was at one spot much diminished, and acutely congested.

The operation appears to me a very hazardous one, and only justifiable where the suffering is becoming unbearable and danger of rupture great. The chief danger in the operation seems to me to be—first, from the shock, which, as far as my experience from this case teaches me, is far greater than after even a difficult ovariectomy, and, second, from hæmorrhage. I see from other published cases that smart hæmorrhage has occurred in several cases after removal of the tumour, as it did in mine, and it might easily happen that one might not again be so fortunate in quickly securing the vessel.

Mr. O'HARA complimented Dr. Fell on the success of his operation, and approved of the methods adopted.

Mr. T. N. FITZGERALD (Chairman) considered the treatment good, and would have done the same operation himself. In obscure kidney cases he advocated an exploratory incision and examination of the organ. He believed lumbar incision to be much safer than one from the front.

CASE OF SCROFULOUS PYELO-NEPHRITIS: REMOVAL OF KIDNEY BY LANGENBECK'S INCISION. LUMBAR DRAINAGE. RECOVERY.

[By H. WIDENHAM MAUNSELL, M.D., T.C.D., Honorary Surgeon
Dunedin Hospital.]

Ellen McM——; married, aged 32 years, was admitted into the Dunedin Hospital on the 25th November, 1885.

Family History.—Father died of rheumatic gout at 87 years of age, and mother died of apoplexy at 35 years of age. Eldest brother very delicate. Eldest sister in Nelson, suffering from a large tumour on the liver.

Previous History.—When eleven years of age she had a white swelling in the right knee joint, which confined her to bed for nearly two years. Since then the joint has been quite stiff, but entirely free from pain. When 21 years of age she had an attack of rheumatic fever. She has been married for the last ten years, and has had eight children.

Two years ago she consulted me for menorrhagia with retroflexion and subinvolution of the womb, which was cured in five or six weeks

under the usual treatment. At that time she complained of pain in the right lumbar region, running down towards the bladder, and the pain was increased on pressure over the kidney, which was decidedly enlarged on that side. The urine at that time was normal in quantity and quality. When she was leaving for her home on the west coast, I told her that if the pain and swelling over the kidney increased she was to come at once to consult me.

She returned home and felt well until the birth of another child eight weeks ago.

Two or three weeks after her confinement (which was rather a severe one) the tumour over the right kidney rapidly increased, and became very painful.

The urine was full of pus, but there was no blood. Since then she has had frequent rigors, followed by exhausting sweats.

25th November.—Present condition. There is a very painful tumour the size of a football filling up the right side of the abdominal cavity, extending from the liver to within two inches of of Poupart's ligament. The urine contains one-sixth of pus, but no blood. Temperature this morning, 101.8°.

26th November.—Passed 45 ounces of urine during the 24 hours, containing about one-tenth of pus. Had severe rigors last night, when the temperature rose up to 103.8°, followed by profuse sweats. A very fine aspirating needle was introduced into the tumour, and a little thick pus removed.

29th November.—The rigors still continue. The urine has been almost entirely free from pus for the last two days.

30th November.—Urine clear. Tumour much more painful.

1st December, 1885.—A consultation was held to-day, and it was decided to perform nephrectomy. As the tumour was of enormous dimensions, the preference was given to Langenbeck's abdominal incision on the outer border of the rectus muscle.

REMARKS.—Five or six days ago the urine was full of pus. Now the pus has entirely ceased, and the urine has become quite clear. From this it was inferred that the ureter of the right kidney was completely occluded, and all the work of elimination was thrown on the left kidney. The tumour is much more painful, but the bladder is less irritable. As this patient had a white swelling of the knee joint some years ago, and passed in the urine large quantities of very thick pus, *entirely free from blood*, the diagnosis was more in favour of scrofulous kidney than renal calculus.

Operation was performed on the 3rd December. All the usual antiseptic precautions were taken, but no carbolic acid was used. An incision was made over the right linea semilunaris, extending from

the margin of the ribs to within an inch of Poupart's ligament. At the lower end of the wound the deep epigastric artery was divided, and torsion applied. The peritoneum was then opened, and slit up to the full extent of the external incision. A large flat sponge wrung out of very warm water was placed over the intestines to keep them from protruding. The second portion of the duodenum, the ascending and hepatic flexure of the colon, and some small intestines were matted together and very firmly adherent over the kidney. These were very carefully dissected off the surface of the kidney *from without inwards towards the spine*, so as to avoid hæmorrhage from the inner layer of the meso-colon, which covers the vessels passing to the ascending colon.

The peritoneum was successfully removed from the upper two-thirds of the kidney, but the substance of the lower third was thinned out like a bladder, and converted into a vast abscess.

In attempting to separate the peritoneum from the expanded and attenuated substance of the lower third of the kidney, my finger passed into the abscess; and now the case might have ended disastrously if I had not had most excellent assistance from my colleagues. One held up the edges of the rent in the abscess, and others packed it round with sponges, while I passed a long sharp amputating knife through the opening in the abscess and out through the loin at the outer edge of the quadratus lumborum, half way between the last rib and the iliac crest. The edges of the wound, over two inches long, were now held well apart with the blades of a long urethral forceps, and when all the matter—*fully four pints*—had drained away by the lumbar opening, a stiff rubber drainage tube an inch in diameter was drawn into the wound with the forceps, and the cavity of the abscess was thoroughly irrigated with warm water, not one drop of matter escaping into the cavity of the peritoneum. The renal vessels and ureter were now dissected out and ligatured separately—the artery first; and when the kidney was completely enucleated its pedicle was divided with a pair of strong scissors fully half an inch beyond the ligatures, and the whole kidney removed. The edges of the peritoneal incision at the back of the abdomen, where it had been dissected off the kidney, were now accurately brought together with cat-gut sutures, and before sewing up the abdominal wound the left kidney was examined and found to be perfectly normal in shape and consistence.

The after history of the case can be seen from a glance at the temperature chart. The temperature never went above 100·6 until the 15th instant, twelve days after the operation, when I removed the drainage tube from the loin, the discharge having almost ceased.

Fifteen hours after this she had a severe rigor, the temperature running up to 102.5. The wound was opened up with a dressing forceps at 3.30 a.m. (just half an hour after the rigor), when some pus made its escape, and another drainage tube was inserted. A few hours later the temperature fell to 99.4. Two days after the temperature ran up again, when I found a kink in the drainage tube. After that the temperature fell below 99, and she left the hospital perfectly well on the 13th January, 1886, just six weeks after the operation.

The amount of urine passed daily varied from 42 to 54 ounces. There was no albumen. Dr. Batchelor kindly estimated the quantity of urea eliminated in the 24 hours (using Prof. Apjohn's apparatus), and found it very slightly under the normal quantity.

Examination of the Kidney.—The upper two-thirds of the kidney, as you see here, is lobulated and converted into nine separate abscesses (containing pus and tubercular masses) varying from the size of an orange to that of a walnut. The pelvis and the lower third of the kidney (removed in fragments) were expanded and converted into a large abscess containing about four pints of pus and tubercular matter. The inflammation had extended from the kidney to the perinephritic cellular tissue, and localised peritonitis had caused the intestines to be matted together over this portion of the kidney. The mucous membrane of the pelvis had ulcerated away, and the ureter was enormously enlarged and thickened, and completely blocked up with soft caseous matter. The prognosis in this case was hopeful. The left kidney was apparently sound, and scrofular or caseating disease of the kidney, if removed, has not the same tendency to spread to other organs as the disseminated tubercular disease.

In conclusion, I may say that I firmly believe that this woman would not have lived more than three days after the operation if it had not been for the lumbar drainage. I have read nearly all the cases recorded of nephrectomy up to date, and I cannot find a single instance of Langenbeck's semilunar incision being combined with all the advantages of lumbar drainage.

Mr. O'HARA thought the supra pubic operation for reducing the bowels an excellent one, but he thought the operation for the radical cure a dangerous proceeding. In the first place the inflammatory action set up by the wire was likely to cause much peritphal mischief; and secondly, that the mere drawing together of the pillars by a single wire would be inefficient. However, this case had been successful, and he hoped Dr. Maunsell would have the same success in the future.

FOOTNOTE.—It is now nearly two years since the kidney was removed, and this woman is fat and strong, and looks the picture of "good health."

REMOVAL OF A FOREIGN BODY FROM THE BLADDER
BY PROFESSOR PETERSEN'S SUPRA-PUBIC OPERATION.

[By H. WIDENHAM MAUNSELL, M.D., T.C.D., Honorary Surgeon
Dunedin Hospital.]

E. S——, aged 18 years, admitted into No. 1 Ward on 30th December, 1886, with a foreign body in the bladder.

Nine weeks before admission the patient pushed a twig down the urethra into the bladder, and while attempting to extract it broke it at the knot or joint, leaving seven or eight inches of it in the bladder.

I saw him a day or two ago, and tried to extract the twig by means of the lithotrite, but only succeeded in breaking off a small piece.

He was then admitted into the Hospital, and on December 31st the supra-pubic operation was performed.

The bladder was filled with 12 ounces of boro-glycerine and water, and the rectum was distended by means of a Barnes' bag in the usual way. An incision was made in the middle line about three and a half inches long, extending from the pubis upwards. The bladder was exposed, and was seized with a pair of catch forceps on either side, and an incision was made between them sufficiently large to introduce the forefinger and extract the twig.

The bladder was now sewn up with six horsehair sutures passed through the muscular coats only. The ends were left long, so as to facilitate their subsequent removal, and at the same time to act as a drain for the urine should primary union not take place.

The external wound was left open and dressed with iodoform and absorbent wool. A catheter was left in the bladder, but as it caused irritation it was removed, and the patient was allowed to pass his water himself.

2nd January, 1887.—No urine has ever passed through the wound in the bladder, which has healed up.

28th January.—External wound healed up.

I have reported this case as it is the first supra-pubic operation that has been performed in New Zealand.

REMARKS.—It is the rectal distension which lifts the bladder into the abdomen, and with it the peritoneal layer.

Sir H. Thompson says:—"I have found considerable advantage in limiting the use of the knife to the fibrous layers, and in employing the finger-nail or an ivory separator to divide other tissues, and draw aside the veins, thus avoiding the risk of *serious hæmorrhage*."

In both of these cases I have gone straight for the bladder with the knife, carefully avoiding all lateral separations of the tissues, which might favour subsequent infiltration.

The chief dangers in the supra-pubic operation are injury to the peritoneum and urinary infiltration. The advantages are, no risk of hæmorrhage.

The wound is much larger and more superficial, enabling you to see and feel better in exploring the bladder. The patient can be kept perfectly dry and the wound aseptic.

This operation should be performed for the removal of foreign bodies, tumours, and all very large and hard calculi.

Mr. O'HARA had taken great interest in this paper, as he himself had published the first cases of the kind in Victoria, and since then he had operated with success in six other cases. He was surprised to hear that Dr. Maunsell's vesical incision had healed without allowing any urine to leak out. In none of his cases had he been able to get such a result, as every one leaked more or less, and had to heal by granulation. He did not like the rectal bag; if blown up sufficiently large to affect the peritoneum it must assuredly cause paralysis of the rectum, and besides he considered it unnecessary, as by having the catheter well curved the bladder can be pulled by direct traction away from the peritoneum. Mr. O'Hara had now given up stitching the bladder walls, as he thought that procedure also unnecessary. He had a passage every three or four hours to keep the bladder as empty as possible during the healing process.

SOME UNUSUAL CORNEAL OPACITIES.

[By M. J. SIMONS, M.D., Ch.M., Ophthalmic Surgeon, Adelaide Hospital.]

Case I., male, aged 20. Always healthy; seen on 16th September, 1886. Complaining of a dark spot noticed about six inches to the right front of the right eye, and a cluster of dots about one inch to lower front of same eye. The dots are always visible, but more plainly in a bright light. The eyes had never been red or inflamed.

Patient is one of a family of two boys and four girls. Of these one girl died at one year old, cause unknown, another girl died at six years old of scarlet fever. No miscarriages, no gout, rheumatism, or phthisis in the family. The father is supposed to have always been healthy, but the mother has been treated for tertiary symptoms for many years.

V R., $\frac{6}{6}$ J 1 — + 1 D H.m.
 L., $\frac{6}{6}$ J 1 — + 1 D H.m.

The eyes appear healthy and bright; good fields and normal tension. The corneal epithelium is entire. The aqueous, iris, lens, vitreous, retina, and optic nerve are normal in each eye.

The cornea appears clear to oblique illumination and to the indirect method of ophthalmoscopic examination, and does not obscure the view of the Fundus. With a + 20 D lens behind the sight-hole of the ophthalmoscope the right cornea shows numerous—about 100—minute, pale, grey, dots, which in no place coalesce; they congregate in the more central part of the cornea, and are absent towards the periphery. The dots are apparently situated in the substantia propria. In the left eye a solitary dot was found at the centre of the cornea. No circumcorneal congestion has since declared itself, and the dots are gradually disappearing.

Case II., female, aged 27. Seen 6th November, 1885. Married seven years; three children; no misadventures. Delicate looking; no appearance or history of any hereditary or acquired specific taint. The family history is phthisical; no gout or rheumatism. Patient is being treated for a “weak chest,” cough, expectoration, and occasional night sweats. Is taking cod liver oil with gradual improvement in health.

V R., $\frac{6}{6}$ partly; unimproved by glasses, J 1.
 L., $\frac{6}{6}$ partly; unimproved by glasses, J 1.

Field and tension normal; eyes look healthy and bright; pupils active; Fundus normal. Media clear by oblique illumination and by the indirect method, but with a + 20 D lens behind the sight-hole in the direct method the corneae were seen to be studded with small, circular, light brown spots, varying in size, the central part of the larger spots being of a lighter brown than the margin—like oil globules under a microscope stained a light brown. The spots were more drop-like than dot-like, separate except at one part where a small one and a large one had coalesced and become pear-shaped.

Case III., female, aged 26. Seen 9th August, 1887. Healthy looking; married; mother of three healthy children, youngest 4 years old. No misadventure. Family history good; no gout, rheumatism, or phthisis. Contracted syphilis eighteen months ago; symptoms very definite. Four months ago noticed black floating spots, about 4 mm: in size, appearing to be six inches in front of eyes, falling in a shower to slowly disappear at the lower segment of the field of vision; also severe frontal headache, lasting a fortnight, after which the spots were not noticed. Then the eyes felt weak and the sight became dim, so that objects were seen as through smoke.

V R., $\frac{6}{9}$ J 1 at 6 " emmetropic.
L., $\frac{6}{9}$ J 1 at 8 " emmetropic.

Field and tension normal. The eyes appeared healthy and bright; the pupils were active; the media clear to oblique illumination and the indirect method; but with the direct method aided by a + 20 D lens behind the sight-hole, each cornea showed a congregation of minute pin-point dots, grey, separate, and appearing to be situated in the parenchyma of the cornea.

In the left eye twenty-two, and in the right four were counted.

Two months later twelve drops in the left eye and two in the right were counted, and these were noted to have decreased in size.

V R., $\frac{6}{6}$ well.
L., $\frac{6}{6}$ two letters.

In other five months only one large dot was seen in the left, and two small ones in the right eye.

V R., $\frac{6}{6}$ perfectly.
L., $\frac{6}{6}$ perfectly.

The refraction was 0.75 D H.m.

Case IV., male, aged 51; healthy; dark swarthy complexion; iron-grey hair; seen June 2nd, 1887.

Always had good health, though residing for many years in tropical parts; married; temperate in habits; no syphilis, gout, rheumatism, or phthisis in personal or family history.

While living in Central Australia the right eye seven months ago became inflamed, very red and painful, and numerous black spots were noticed floating in all directions.

V R., $\frac{6}{12}$ emmetropic, J 8 c + 2.25 D = J 1 slowly.
L., $\frac{6}{6}$ emmetropic, J 8 c + 2.25 D = J 1 well.

Field and tension normal.

On the posterior surface of the cornea, visible to the naked eye, are an enormous number—estimated at 200—round dots, which appeared brown in color in front of the pupil, and black over the iris. The iris was thickened, discolored, and bordered by a thick fringe of pigment at its pupillary margin, tying it down to the lens, otherwise the anterior lens capsule was free from pigment; the iris was inactive to atropine.

It will be recollected that the cornea is a transparent structure of an average thickness of a little over one mm., composed of five layers—the anterior epithelium, anterior elastic lamina, substantia propria, posterior elastic lamina, and posterior endothelium—and it will be recognised as difficult to precisely indicate the exact layer in which minute changes may exist. The diseases known to produce dot-like corneal opacities are the keratitis punctata of sympathetic

ophthalmia, and aquo-capsulitis affecting Descemets membrane, and the commencement of interstitial keratitis, and possibly tubercular deposits affecting the substantia propria.

In sympathetic ophthalmia and aquo-capsulitis the deposits of lymph are easily recognisable as involving Descemets membrane, whilst the exciting cause in the one and the symptoms of serous iritis in the other plainly shows their nature.

Mr. Hutchison, in his classical memoir on "Eye Diseases in Inherited Syphilis," teaches that "chronic interstitial keratitis usually commences as a diffuse haziness near the centre of the cornea of one eye." . . . "There is at this stage no ulceration, and exceedingly slight evidence of the congestion of any tunic. The patient, however, almost always complains of some irritability of the eye, as well as of dim sight. If looked at carefully, the *dots of haze* are seen to be in the structure of the cornea itself. In the course of a few weeks, or it may be more rapidly, the whole cornea, excepting a band near its margin, has become densely opaque by the spreading and confluence of these interstitial opacities. Early in this stage the comparison to ground glass is appropriate. There is now almost always a zone of sclerotic congestion, and more or less intolerance to light, with pain around the orbit. In one or two months the other cornea is attacked, and goes through the same stages, but rather faster than the first. A period in which the patient is so far blind that there is but bare perception of sight now often follows, after which the first eye begins to clear. In the course of a year or eighteen months a very surprising degree of improvement has probably taken place. In milder cases, and under suitable treatment, the duration may be much less than this, and the restoration to transparency complete; but in many cases patches of haze remain for years, if not for life. In the best recoveries the eye usually remains somewhat damaged as to vision, and often a degree of expansion of the cornea is apparent."

In vol. V. of the "Transactions of the Ophthalmological Society" Mr. Benson describes a case of probable tuberculosis of the cornea and iris. There was a phthisical history, but the patient had no symptoms of phthisis. In the left eye a somewhat flattened cornea was rendered opaque by masses of yellowish-grey translucent material, several of which had coalesced with vascularity around the bases of the larger masses, mostly of these near the periphery of the cornea. The anterior chamber was shallow, and there were small nodules of yellowish colour on the iris; at the angle of the anterior chamber the masses seemed to fill up the space between the iris and the cornea. There was deep circumcorneal vascularity. Bare perception of light, and the tension gradually fell to — 2.

The right eye, recently affected, showed considerable zonular vascularity, and the masses involved the cornea, iris, and anterior lens capsule. These masses after microscopical examination were considered to be non-tubercular.

In cases I., II., and III. the physical type recognised in the offspring of syphilitic parents was absent. The history of snuffles and skin eruption, the senile appearance, earthy complexion, coarse texture of skin, furrowed cicatrices about the angles of the mouth, nodes on bones, the altered shape of the permanent teeth, were all conspicuous by their absence.

Case I. has the history of interstitial keratitis, and the appearance of the corneal change may be likened to the early stage of that disease, as described by Mr. Hutchison; but not only did no further symptom declare itself, but the subjective symptom has entirely disappeared, and the objective symptom nearly gone. It was treated as interstitial keratitis, and may be accepted as a case of that nature early recognised and treated.

Case II. points to a tubercular change in its history, and insomuch as the condition disappeared with the gradual restoration to health from what was regarded as a case of phthisis.

Case III. occurs in a definitely syphilitic subject, and may be due to syphilitic deposits in the true corneal tissue.

Case IV. appears to be unique, and offers no explanation other than a liberation of uveal pigment during iritis, the pigment particles attaching themselves to the convenient posterior lining of the cornea.

These cases are brought to your notice as unusual corneal changes, and if their pathology is indefinite, they at least show the value of careful examination of the cornea by high plus lenses in obscure cases.

THE NECESSITY OF EARLY OPERATION IN CASES OF COMPOUND DEPRESSED FRACTURES OF THE SKULL IN WHICH THERE IS REASON TO APPREHEND THE ONSET OF BRAIN IRRITATION FROM THE PRESENCE OF BONE FRAGMENTS.

[By PHILIP E. MUSKETT, Honorary Surgeon to the Sydney Hospital.]

By way of introduction I think it befitting to bring under your notice the following words of Erichsen in speaking of the treatment of depressed fractures of the skull. He says:—"So far as my own

experience is concerned, which is necessarily drawn purely from civil practice, I can say that, with the exception of the case which has just been referred to—(a case which he had narrated)—I do not recollect ever having seen a case recover in which a compound depressed fracture of the skull occurring in the adult had been left without operation; but I have on the other hand seen several instances of recovery in which the bone had been elevated and fragments removed." Now this statement coming from so eminent and well-known an authority is full of interest, and should carry great weight in any discussion relative to the treatment of these cases, so with this object in view I have referred to it, in order that it may form a basis for any arguments which may follow.

In the face of the recent triumphs and gratifying successes in the domain of brain surgery which have been recently recorded under the hands of Mr. Victor Horsley, Mr. Pearce Gould, Mr. Rickman Godlee, and others, with their eminent coadjutors, it may seem a matter of comparatively small interest to advocate any individual opinion with regard to the treatment of compound depressed fractures of the skull. But believing as I do that many of these cases terminate fatally (either immediately or remotely) from the surgeon in charge pursuing too quiescent a policy, I have endeavoured for some time past to throw the little weight I could on the side of what I consider to be their proper treatment, and to uphold as far as lay in my power the principle of the early removal of all depressed fragments which might be likely to prove a source of brain irritation. It must be recollected, too, that compound depressed fractures of the skull are comparatively common, and are likely to come within the cognizance of us all; while the refinements of diagnosis involved in the detection and localization of morbid growths within the brain, together with the exceedingly high character of surgical skill which is necessarily required in their removal, will place such cases beyond the pale of the every-day surgeon. But in Australia, where head injuries are by no means rare, surgeons have to practice in remote or isolated localities, and are debarred from the advantages of consultative opinion and assistance. I urge, therefore, that it is very necessary they should be well acquainted with the practical treatment of these injuries, and no less important is it for them to act upon their knowledge when occasion requires it. By the kindness of Mr. Creed (to whom also I desire to express my indebtedness for bringing the present paper under your notice) I have been enabled to place before you a tabulated analysis of twelve successful cases (after operation) of compound depressed fracture of the skull, compiled from a total of 22 cases, in which operative measures were

resorted to at the Sydney Hospital. In that paper I have contrasted these results with those which were accessible to me from all sources. Thus I quoted Nelaton's statement that of the sixteen cases of injury to the head in which the trephine had been used in the Parisian Hospitals during fifteen years, all terminated fatally; while out of 45 cases, according to Erichsen (reported by Lente, of New York), only eleven recovered; and, finally, that Bryant records but twelve recoveries out of a total of 51 cases at Guy's Hospital during seven years. In three separate contributions to the *Australasian Medical Gazette*, viz., in July, 1883, in December, 1883, and in October, 1886, I have pleaded to the best of my ability for the removal of all irritating fragments in those cases where there is reason to suspect splintering comminution of the inner table, whether symptoms of compression are present or not. Even if there be recovery without recourse to operation in such instances, would not the patient's condition, I would ask, be always a source of grave apprehension in the future. As William MacEwen has well pointed out—"In not a few of those cases in which immediate recovery has taken place without operation, and the patient has been discharged from the hospital as cured, yet in the course of months certain cerebral changes become developed, as evinced by motor, sensory, or psychic phenomena; and in some these affections become permanent or ultimately lead to a fatal issue." Which one amongst us if he sustained a fracture of this nature, and happily recovered by operation, would not find satisfaction in knowing that he was secure from the deplorable after effects which might accrue from the persistent irritation of the brain by the presence of sharp edged fragments of bone. With regard to the pertinent question as to whether there are any special dangers attached to operative procedure in these cases, I would reply that with due antiseptic precautions, and with a reasonable amount of surgical skill, the dangers attached to such operations are in no sense so much to be dreaded as the risk incurred by letting chance do what it may, and leaving Nature to do her best or worst as the case may be. Many surgeons act promptly in cases of punctured fracture of the skull, in accordance with the universal opinion that such are unusually dangerous and require immediate and special treatment, but fail to recognise the important fact that the other varieties of fractures of this region, although not coming under the strict definition of punctured, fractures yet possess the same intrinsic dangers, and require equally active treatment. We are told by all the recognised authorities, and wisely, that punctured fractures of the skull are to be treated by operation without delay, the reason adduced being that the comminution and splintering of the inner table is far and wide, and that

the object of early action is not to remove symptoms of compression which may or may not exist, but to prevent the inflammation which must surely follow if these irritating fragments are allowed to remain in contact with the dura mater. With regard to the consideration of this question of brain irritation I contend, and the chief purpose of the present communication is to draw attention to the fact, that very few compound depressed fractures of the skull, be of what variety they may, *are* exempt from the dangerous characteristics which are ordinarily supposed to belong to the true punctured fracture alone. Therefore I would earnestly impress upon surgeons the importance of recognising the dangers attached to each and every form of all compound fractures of this region, and whether pressure symptoms be present or not. I believe the right practice when there is evidence presumptive of a widely extended splintering of the inner table is to operate without delay. There is one other point to which I desire briefly to refer, and it is that I am quite in accordance with Mr. Harman Tarrant, my colleague at the Sydney Hospital, from whom as house surgeon I learnt the value of Hey's saw in preference to the trephine in all cases where its employment is possible, and I may add that there are but few instances in which it cannot be used with advantage. I believe there is no direct advantage to be gained from the trephine, but with the Hey's saw by cutting out a V-shaped piece from some convenient situation an equal space for using the elevator is availed of without the necessity of removing so much bone. Also in the conduct of these cases antiseptic measures are to be adhered to, a fair amount of scalp and pericranium is to be reflected in order to afford room for manipulation, the latter membrane is to be carefully preserved, free exit for drainage in a dependent position ensured, and the greatest care and attention bestowed on the after treatment of the case.

As bearing a practical application on the foregoing, I have furnished the following short report of a case of compound depressed fracture of the skull which came under my care recently at the Sydney Hospital, and which terminated successfully:—Joseph D., aged twelve, a schoolboy, was admitted to the accident ward of the Hospital, at 7.45 a.m., March 12, 1887—the history of the case being that he had been kicked on the head by a horse a quarter of an hour before, and that he had been picked up in a state of insensibility. When admitted he was still unconscious, and was regarded by the house surgeon to be in a dangerous condition; but soon afterwards he came round slightly, there being some degree of response to conjunctival stimulus. On examination it was found that there was a lacerated wound about two and a half inches in length at the back

of the head, over the region of the posterior portion of the left parietal bone. The finger passed into the wound detected a considerable depression of the outer table of the skull corresponding roughly in extent to that of the scalp wound. The outer table was split into two fragments longitudinally, between which the probe could be passed for some distance, showing marked depression of the inner table. After consultation, in view of the evidently widespread injury to the inner table, it was decided to elevate and remove, if necessary, whatever fragments were depressed or irritating the dura mater. The requisite preparations for the operation were made, and the patient placed under the influence of chloroform, of which anæsthetic but little was required. The head was then completely shaved, for the double purpose of carrying out antiseptic measures and of facilitating the after treatment by the more efficient application of the ice bag. After washing the scalp freely with a warm solution of one in forty carbolic lotion, the horns of the original wound were enlarged, and the superior scalp flap reflected upwards, the pericranium beneath being carefully preserved and lifted gently as well. From the inferior edge of the wound another incision was made, and the smaller flaps on each side of it turned downwards in a similar manner, the object of the latter incision being to give room for manipulation as well as for dependent drainage. A small wedge-shaped piece of bone was then removed by means of Hey's saw and forceps from the contiguous and intact bone, and through the opening so formed an elevator was passed beneath the outer table fragments. These were removed with comparatively little difficulty, when the diffused nature of the injury to the inner table became clearly seen. The fragments of this latter were comminuted and depressed to a considerable extent, and the projecting corner of one being seized, by careful manipulation it was gently separated from the rest and withdrawn. The remaining comminuted portions were then removed, when the dura mater was fortunately discovered to be intact; and as the brain rose well up to the level of the inner table, the case looked promising. All angular projections were rounded off with the bone forceps, and the pericranial and integumental flaps replaced. These were approximated together with silver wire sutures, but more loosely towards the dependent part, so as to leave free exit for drainage, and a piece of gauze soaked in a weak carbolised lotion was kept lightly in position by a turn or two of gauze bandage as a dressing. The patient was placed in the quietest part of the ward, and screens arranged around the bed, so as to keep him as undisturbed as possible. Dry cold was applied to the head by means of the ice bag, and a calomel purge administered, the diet being kept

low in addition. Everything progressed satisfactorily after the operation. The wound healed up kindly, and the notes state that he was up and about on March 26, the fifteenth day after the operation. A few small shells of bone escaped subsequently, but the boy is now in robust health.

POST-NASAL VEGETATIONS.

[By W. ANSTEX GILES, M.B., Ch.M., Assistant Surgeon Adelaide Hospital, Lecturer on Otology, University of Adelaide.]

I prefer to employ the above nomenclature adopted by Dr. Woakes, of London, for the disease which was first brought prominently before the medical profession in England by Dr. Meyer, of Copenhagen, under the name of "Adenoid Vegetations."

The study of this affection is full of interest to the general practitioner as well as to the specialist for many reasons, amongst which are the discomfort, often amounting to distress, brought about by the presence of these growths, the disastrous consequences to the Eustachian tubes and tympanum traceable to this cause, and finally the rapid and very satisfactory results usually obtained after surgical interference. I do not profess to bring forward anything original in this contribution, but propose to give a rapid sketch of the principal features of the disease, and to mention what I consider the best method of treatment to effect a cure.

At the International Medical Congress of 1881 this subject was fully discussed by Drs. Meyer, Guye, Löwenberg, Woakes, and others, who had devoted much attention to it. Since then the disease has received more notice than formerly, and many monographs have been published having reference to it.

These growths assume different shapes, and vary greatly in consistence, some being extremely soft and brittle, others hard and tough. They bleed remarkably easily, are covered with secretion, and on account of the irritation they set up they generally cause some hypertrophy of the mass of glandular tissue situated on the pharyngeal vault, known as the "pharyngeal tonsil." A distinct artery and vein enter each vegetation and ramify through it.

Microscopically the growths consist of lymphoid tissue with a connective tissue basis simply showing a great increase of the elements normally existing in the situation they occupy. The whole mucous membrane of the naso-pharynx, when these growths exist, is

in a state of chronic catarrh, and this extends by continuity into the Eustachian tubes, nose, and down the back wall of the pharynx. In the majority of cases, I have seen, a condition of granular pharyngitis has been present, and in many cases the tonsils are enlarged. As a rule when chronic hypertrophy of the tonsils is present it is advisable to explore the naso-pharynx, when very often it will be found necessary to clear out that cavity before all the patient's symptoms are relieved.

The greater frequency of this disease in the north of Europe and other localities where a damp, cold atmosphere is constantly breathed, tends to favour the assumption that cold and moisture predispose to its occurrence. That there must be other factors at work is certain, as the affection is very common in the dry temperate climate of South Australia, and Dr. McBride, in a communication to the Medico-Surgical Society of Edinburgh, dwells upon the rarity of post-nasal vegetations in that city, where it is hardly necessary for me to add the cold in winter is intense and the rainfall abundant. There are undoubted instances reported where the growths are congenital, and hereditary influences play an important part in their etiology.

Dr. Woakes has advanced the theory that in these cases there is an inherited proclivity to an increased blood supply to this part, owing to some aberration of the vaso-motor system. They are met with in all classes of society to the same extent. Children generally suffer, and it is comparatively seldom that they are present after 15 years, but they have been found in adults 25 years of age. It is stated that cleft palate favours their development (Löwenberg).

Dr. W. Meyer, of Copenhagen, found this disease in one per cent. out of a large number of children examined in England; two per cent. in 2,000 examined in Copenhagen.

Dr. Adolph Meyer discovered it in less than 1 per cent. in 700 children who came under his observation in Florence. With regard to South Australia I have not been able to collect any statistics as to the frequency of these vegetations, but my short experience in Adelaide will enable me to state that they are by no means uncommon.

It is, I think, generally admitted that the tendency is for these growths to gradually disappear as the child grows up, but Dr. Schech in his work on "Diseases of the Mouth, Throat, and Nose" says:—"Spontaneous recovery has never taken place so far as I know." While present they increase in size and number, new ones constantly springing from the diseased mucous membrane. They may spread down the posterior wall of the pharynx and appear below the

soft palate. Perhaps their disappearance when adult life is reached may be accounted for by the fact that the space in which they are situated increases in size more rapidly than the abnormal growths, the ventilation improves, and the secretions are enabled to escape easily, with the result that the vegetations gradually wither away.

In a well marked case when the child is first seen, the vacant expression, heavy breathing, open mouth, and hanging under-lip strike the observer. The symptoms all point to some obstruction to free nasal respiration, and are often very distressing. Snoring is usually complained of, which frequently prevents the child from obtaining proper sleep. This is what caused the parents most anxiety in the last case I saw. Taste and smell are often interfered with, and Dr Löwenberg has noticed some deformity of the chest wall, but this must be rare, as many competent observers have never met with a case illustrating this condition. Violent paroxysms of asthma may be set up by the irritation caused by these growths in the naso-pharynx, and various forms of neuralgia are attributed to their presence. A general catarrhal state of the mucous membrane in the immediate neighbourhood is the result, and frequently the Eustachian tubes are affected by an extension of this catarrhal process, giving rise to deafness. This may pass on to the tympanum and be the cause of ear disease of a more or less severe description—sometimes acute suppurative inflammation of the middle ear and perforation of the membrana tympani follow.

Granular pharyngitis, so often present, is set up partly by the irritating secretions which are continually running down from the naso-pharynx, and partly because buccal respiration is necessary, owing to the nasal obstruction. Prof. Snellen has noticed that a chronic conjunctivitis is occasionally to be found depending upon this disease. It is most intractable, and defies all treatment so long as the original affection persists, but as soon as the growths are removed and the naso-pharynx becomes more healthy the eye trouble rapidly disappears. Prof. Guye has operated upon a number of Prof. Snellen's cases with the best results.

After noticing the symptoms and general appearance of the child, the surest and speediest method of making a correct diagnosis is by palpation. The index finger of the right hand should be passed up behind the soft palate, when the naso-pharynx can be thoroughly examined. I have found no difficulty about doing this, and after a little practice it may be accomplished rapidly and effectually. When possible the surgeon should avail himself of posterior rhinoscopy to see the position of the growths, Eustachian orifices, &c., but as a rule with young children it is most unsatisfactory.

I first intend to describe the method of treatment I have adopted in the cases which have come under my care, and afterwards will mention other processes described and advocated by the principal authorities.

The patient having been put under the influence of ether, the shoulders are raised by pillows, and the head allowed to hang down over the end of the operating-table. This position is a very convenient one for the operator, rendering the naso-pharynx more easy of access than any other, and thus simplifies the work. A very great variety of forceps has been invented for this operation. Amongst others are those of Drs. Störk, Catti, Löwenberg, Schech, Voltalini, &c.; all no doubt good, but the best I have yet met with is a modification of Dr. Löwenberg's forceps, by Dr. Woakes, of London, and I feel sure this opinion will be shared by all who use them. At any rate they answer the purpose admirably, and I could not wish for better.

With the forceps in my right hand, and the index finger of the left in the naso-pharynx to guide the blades to the base of each growth, I remove one after another until the space is quite clear. When the growths are very numerous and tough it is possible for an inexperienced finger to mistake the posterior lip of the Eustachian tube for a vegetation, and cause some unnecessary tissue to be lost, with every likelihood of severe Eustachian inflammation following. I notice Mr. Creswell Baber, in a paper published in the *British Medical Journal* last year, uttered a warning to this effect, and it is as well to bear it in mind. I don't think such an accident is at all probable, but it is just possible it might occur. When as many of the tumours as can be got away with the forceps have been removed, I scrape the roof and posterior wall with Dr. Meyer's ring-knife, introduced through the nostrils, to get rid of any portion that may be left behind. The bleeding is usually severe, but runs freely out through the nose, or can be mopped up with a sponge. It is needless to add no blood can escape into the larynx when the operation is carried out in the way I describe. Since October, 1886, I have operated thirteen times, following out the details given above, with the most gratifying results; in every case very great improvement was observed after the removal of the vegetations. Usually two or three weeks must elapse before the full benefit of the interference can be expected and the mucous membrane reassumes a healthy condition. Though this may appear a trifling affection, and the method adopted for bringing about a cure exceedingly simple, there are few operations I know of that give so much satisfaction to patient and surgeon.

In mild cases relief may be obtained by the use of alkaline sprays or douches directed into the post-nasal space. Marked improvement has been obtained by the application of various caustics, *e.g.*, London paste, chloride of zinc, &c. The galvano-cautery is used as a curative agent with success.

Some operators employ a snare so contrived that it can be passed up behind the soft palate; the wire loop made to encircle the growth and cut it away.

Dr. Meyer, of Copenhagen, operates with a ring knife introduced through the nostrils, having first passed up the index finger of the left hand to act as a guide. The patient remains in the sitting position, takes no anæsthetic, suffers little pain. Dr. Meyer once cleared the naso-pharynx of a timid boy, aged 11, without his being aware of it. Perhaps the children I have come in contact with are particularly fractious, or whatever the reason may be I know not, but none are willing to allow the process of palpating the pharyngeal vault to be repeated without remonstrating, and would never permit instrumental interference of the nature required without offering determined opposition. Dr. Guye, of Amsterdam, removes the vegetations with the finger nail. This is the simplest and, I should say, the best method, provided the finger nail is strong enough to accomplish the task. For the soft friable vegetations nothing could be better. Dr. Woakes uses for this operation the forceps I have already alluded to, usually administers an anæsthetic, and the patient is kept in the sitting position.

Dr. Hartman, of Berlin, claims priority in operating on these growths with the patient under an anæsthetic. When the tumours are sessile he scrapes them away with a sharp spoon; when they are pedunculated he cuts them off with a wire loop introduced through the nose or mouth. Dr. Michael, of Hamburg, uses a pair of gouge cutting forceps, which he finds more effective than any other kind, particularly recommending them because any physician can operate with them without requiring special skill. He deprecates the employment of anæsthesia on account of the danger of pneumonia, caused by the inspiration of blood during the operation. Dr. Troutmann, of Berlin, has published an exhaustive monograph on the methods of treating this disease. He prefers to use a sharp spoon; has the patient in a sitting position, with his head and hands firmly held by assistants, and lays special stress on the importance of not allowing the fragments to fall into the larynx while being removed.

Ear and throat complications will require special after treatment. It is generally recommended that alkaline douches or sprays be used for a few weeks after the operation. Dr. Meyer very thoroughly

cauterises the parts with solid nitrate of silver immediately after the removal has been effected, and subsequently sprays or douches with salt and water. Others do not employ caustics, but prefer insufflations of powders, such as boracic acid, tannin, &c., until the mucous membrane has reassumed its normal condition. If the growths are thoroughly eradicated at the operation I think all will go well without any after-treatment, and there is little likelihood of their recurrence. This has hitherto been my experience, and I have every reason to speak most favourably concerning the success of treatment in these cases, if carried out in the way I have described.

In conclusion, I wish to express my sincere thanks to Dr. Gardner, who very kindly has handed many patients suffering from this complaint over to me for treatment.



SECTION OF GYNÆCOLOGY.

Chairman—JOSEPH FOREMAN, L.R.C.P., M.R.C.S., &c.
Obstetric Physician, Prince Alfred Hospital, Sydney.

CHAIRMAN'S ADDRESS.

READ IN GENERAL MEETING OF CONGRESS.

When I was requested to deliver the address in this section I felt it was an honor I had no right to refuse, though there are others whose age and attainments might be cited as more fitted for the distinction, but it is perhaps not out of place that in this youngest branch of medicine one of the junior members should have been chosen to deliver the address in gynæcology at the first Medical Congress in Australia.

The subject of gynæcology has assumed too great dimensions for anyone to expect to do it full justice. We have evidence that it excited interest in very early times, for in the excavations at Pompeii vaginal specula almost the same as some of those in present use were discovered in the building known as the Surgeon's House, and we may take it for granted that the diseases of women were well understood when we find special instruments in a fair state of perfection. The inventor must have had a good knowledge of his subject and the difficulties he had to surmount.

Gynæcology, like all other branches of learning, was in a state of decadence during the middle ages, and it was not until the Chamberlains astonished the medical world by the invention of forceps late in the sixteenth century that we hear of anything of moment in obstetrics. Gentlemen, we need not sigh for the good old times either in the way of practice or of ethics. The Chamberlains made a great fortune by keeping their invention a secret, and their name has since been justly held in contempt, as men who kept to themselves for purposes of gain a discovery which would have been the means of saving the lives of numberless women had they had the interest of science and humanity at heart instead of the mere accumulation of lucre. It is now rightly considered the duty of every man to give to his colleagues the benefit of his experience for the advancement of the profession in general, and as a consequence for the

public good. It is felt that no man should work merely as an individual, but as one of a noble profession, which it should be our pride to uphold and advance in every way.

A great step in gynæcological knowledge was the re-discovery of the vaginal speculum by Ferguson, which still goes by his name. What a flood of light was shed on the subject by this simple instrument. Until its introduction practitioners had been working in the dark, but this discovery brought about a revolution, and as in all revolutions, those living at the time had to suffer the effects of sudden change in previously conceived ideas. That was the age of Sangrado, when blisters, calomel, and bleeding reigned supreme. So when the cervix was exposed to the light of day and seen to be the seat of so-called ulceration caustics were recklessly applied, and the unfortunate victims were tortured without compunction. The practice is rightly and properly being discarded, yet I am sorry to say there are some men left who are too conservative to realize the full extent of the mischief they do. To all such I earnestly recommend Emmett's work on diseases of women and the careful digest of the part on laceration of the cervix. It was not until gynæcology was made a special study comparatively recently that there was any great advance made, and most of those who were the first to practice it are still living. The loss of Sir J. Simpson, Marion Sims, Baker Brown, and Tyler Smith we all have to regret. This brings us to the question of specialism in medicine and surgery, which is looked upon with great disfavor by some amongst us. For my part I fail to see the validity of the objections raised to it. All the great strides in the different departments of medicine have of late been made by men devoting themselves to one or few subjects, and certainly without specialism, gynæcology would be in a far different position to what it is. It cannot be denied that the man who passes the catheter most frequently is *ceteris paribus* most likely to be the most skilled in its use, and the same thing holds good in other things—the more the practice the greater the knowledge and skill.

Gynæcology has a great future before it, but we are only on the threshold of the subject. Exact knowledge has only lately been acquired, and the numerous ideas and modes of treatment advocated are still so varied as to make us fully realize the difficulties still to be surmounted. The chief and most valuable achievement is the great skill and exactitude which has been obtained in diagnosis, for though we meet with many puzzling cases it is unquestionable that this most important element has been brought to a high state of perfection, and where there are so many earnest workers who are thoroughly masters of the subject, comparing all their impressions and ideas, we

shall soon see the treatment placed on a more satisfactory basis than any other department of medicine.

The next decade will work wonders in gynæcology; until now we have been but finding out the first principles, and have had to contend against former erroneous teaching, but every day the ground becomes clearer and easier to get over. The introduction of ovariotomy was undoubtedly the commencement of what may fairly be termed the gynæcological epoch. The first case, and that a successful one, was that operated on by MacDowell, in Kentucky, in 1809. One cannot sufficiently admire the courage and skill which emboldened him to enter upon this, then unknown, field, surrounded as it was with mystery and doubt as to the possibility of success, with the terrible peril to the patient and to his own professional reputation, ever before him. It was not only a happy thing for the poor woman and himself, but the beneficial results of his success have been incalculable, for it gave an impetus to inquiry as to what was, and what was not, practicable as to surgical interference in these cases. For some time he was not believed, but gradually others followed his example, and with such success that to-day ovariotomy enjoys the unique position of not having detractors.

An able paper will be read by Dr. Pinnock, which will afford an ample field for the discussion of this pre-eminently interesting subject. The violent opposition these early pioneers had to undergo is almost incredible. It should never be forgotten that every surgeon who undertakes a grave operation imperilling the life of his patient should not do so without a due sense of the responsibility, both to the sufferer and to himself. Not only is there that dread of sacrificing the life of a fellow being whom he wishes to serve, but should he fail there is a certain amount of injury done to an operation which he is doing his utmost to advance, and an opportunity given to carping critics, who are only too ready to seize it. The world in general, and gynæcology in particular, owe nothing to these selfishly prudent critics, and were the matter left to people of this disposition we should still be where we were centuries ago. The care and difficulties attendant on these operations is little understood by those who never use the knife, and it is impossible to explain the fascination abdominal surgery exercises when we view its concomitant anxieties. The greatest and most successful ovariotomists are still living, and have given us full accounts of their early troubles. They are so numerous and well known that it is not necessary to mention them. The pedicle was first treated extra peritoneally, and it was reserved for Tyler Smith to make the vast advance of tying and returning it, by which the mortality was greatly reduced, and a new impetus given

to the operation. This practice continues to the present day. We must not lose sight of the fact that the success attending ovariectomy has not only advanced gynaecology, but has given such confidence to surgeons generally that the opening of the peritoneal cavity is not the terrible peril which until this experience had been gained it was always supposed to be. With what good results this new field of surgery has been availed of we all know. There is not an organ in the abdomen that has not been attacked, and successfully. The stomach, liver, spleen, kidney, pancreas, have all yielded wonderful cures, but to my mind the most astonishing of all has been the three cases of rupture of the bladder in the male, successfully operated on lately by Sir W. MacCormac. Much as we had learnt of the peritoneum, though we had got far beyond what I might almost call the superstitious phase of it, there were few prepared for this, and it teaches us that we should not abandon desperate cases to their fate when such brilliant results are obtained in seemingly hopeless ones. I don't know how it will affect the question of antiseptics. There is nothing so irritating to the peritoneum as urine. There was an open wound, and there must have been bacteria, and possibly a bacillus might have been discovered, but in spite of all these, and in consequence of cleanliness and drainage, they got well without any difficulty. For my part I do not believe much in antiseptics in abdominal surgery. Carbolic acid, iodoform, and bichloride of mercury have all had their victims, and have been the cause of great trouble in many cases. The introduction of antiseptics has been one of the greatest steps ever made in surgery, but I do not think it was on account of the substances used, which are generally irritating, but the great cleanliness which was required in their application. Surfaces had to be thoroughly dried with clean sponges; the nail-brush and soap were in constant request, and the clothes of the bystanders were also in a fitter state than formerly obtained. My antiseptic treatment is practically nil. Instruments are kept by all of us in carbolic lotion, too weak to kill germs, so that I fail to see the advantage over plain water. The dressings I use are of the simplest, and I have no objection to exposure of the wound to the air. The danger is never from the external wound, but deep down in the pelvis. I know perfectly well that if the pedicle is secure and the abdomen quite dry, and no prospect of oozing, the patient will be up in about ten days, without having had a temperature of 100° . On the other hand if there is any sagging of fluid in the abdomen, septic symptoms develop in the shape of high temperature and quick pulse, but if a free exit is given the normal condition soon ensues. The proper meaning of antiseptics will before long be recognised by its proper name, namely, extreme cleanliness; and though I defer to the general feeling in their favour, I am quite sure the cases would do just as well without them.

The careful records of observations which have been made by the numerous operators of these days have so forcibly shown how comparatively small is the danger of opening the abdomen when done with proper precautions, that it is felt in most cases of doubtful diagnosis in grave troubles to be a less risk to the permanent well-being of the patient to make an exploratory opening, and so ascertain with certainty the nature of the case, than to leave it to time to develop, which can only be at the cost of suffering to the patient, and perhaps the loss of opportunity of saving life.

The immense advance in the physiological and pathological knowledge of the functions of the uterus and its appendages in health and disease which has taken place within the last few years, chiefly as the result of abdominal operations, is incalculable. Nevertheless there still remains ample scope for discussion, and a wide field is open for accurate and energetic observers to distinguish themselves in. For instance, it is yet a moot point as to which men equally capable of forming an accurate idea still widely differ, whether menstruation is dependent on the presence of the ovaries or of the Fallopian tubes—a matter really of very great interest. It is only recently that we have been able to grasp the full meaning of the various enlargements in close proximity to the uterus, which used to be generalised as parametritic exudations. Now, as a consequence of the many opportunities afforded of actual vision by the numerous cases of abdominal section, we know that they are due but rarely to parametritis, but in the vast majority of cases to enlarged tubes or ovaries, the difference between which, with our advanced knowledge, is now by no means difficult to distinguish. The consequence is, that patients, instead of being sufferers for years, awaiting the future with dire forebodings, are relieved of their troubles in the early stage of the disease, instead of remaining the chronic invalids formerly so numerous. Recently it has been learnt by the same means that ovulation and menstruation are quite independent of each other, ova having been frequently found during abdominal operations in the act of obtrusion at periods in no way synchronous with the menses. It has often been said that uterine diseases are much more rife than formerly, and with justice, but not to the extent one would imagine.

Crowding together in large cities is not conducive to the development of the human race in any particular, and the various absurdities of fashion would afford an onlooker a continual source of amusement were it not that the effects are often so fraught with evil consequences.

Women, in the aggregate, lace tightly, but individually they all resent the soft impeachment.

They forget that while they are growing the body can be moulded into almost any form without excessive pressure being brought to bear, and so they are gradually brought into what is unfortunately termed a good figure, at the expense of compression and downward displacement of the various organs; for cases are not uncommon of the liver having been forced into the abdominal cavity below the ribs, and we may imagine what must have been the pressure on the organs below. It is melancholy to contemplate the suffering undergone in such a case simply for the object of appearing like a *Marrionette*.

We find the children of parents whose ideas are not so far advanced, and who insist on their girls taking plenty of out-door exercise, well-built strong women, of good figure, because symmetrical; and in these, as a rule, the troubles of pregnancy and child-bearing are few.

The excessive mental strain now common amongst young women in preparing for the Universities is a decided drawback. I think a great deal of the mischief is due to the fact that they do not take a longer time—one or two years is not much in a young life—and so save themselves at a period when they require rest.

I have been struck with the number of teachers who complain of uterine affections; whether it is due to so much standing at all times, or whether mental work at the same time plays a part in it I do not know, but certain it is that the proportion of sufferers amongst this class is altogether out of proportion. The practice of keeping shop girls on their feet without cessation for several hours is simply inhuman, and often the cause of illness. When speaking of the increased numbers of women suffering from uterine affections we must not lose sight of the enormous increase in the population. I think that women who lead free healthy lives are much better than they were formerly, and the expression “we used not to hear so much of these things” is quite true for the best of all reasons, for very little was known about them. When the vaginal speculum was used first there were found hundreds of women with erosions which had never been suspected, and even now troubles are often traced to their proper origin and cured, instead of lasting an indefinite time under the guise of debility.

The custom now so prevalent of preventing conception is one full of danger to the health of women, and many pay the penalty. It is one of the excrescences of our social life we have least reason to be proud of, for the moral as well as the physical well being of the community suffers.

The progress in treatment, other than surgical, has kept pace with

the general advance, and though we are told that the modern gynæcologist is too fond of the knife, the accusation is unjust, and it only arises because so many of the ailments of women are caused by mechanical troubles, generally originating in childbed, which are amenable to no other form of treatment. To take the common case of so-called ulceration—a term that has done so much harm to patients and to gynæcology—which in married women, in nine cases out of ten, is due to laceration of the cervix, is it fair to try to heal a healthy mucus membrane, when by a simple operation, which entails as much risk as the extraction of a tooth, the trouble can be got rid of in about three weeks? The mind of the gynæcologist at the present day should be of the most liberal stamp, open to receive and weigh any method of treatment; and if those who decry operations will suggest other means for as good and permanent relief, they will find us only too ready to resort to them.

The chief remedial agent we now use, and one of the best because it is so simple, is the use of hot water of a temperature of 110° to 120° , which, to be of any benefit, should be used whilst in the horizontal position. As to drugs exercising any special action on the pelvic organs, there is not much to boast of. The best are undoubtedly the bromide of potassium and ergot. The former, when it does act beneficially, acts very quickly, and like a charm. If improvement does not set in almost immediately, little advantage will be derived from its long-continued use. In gynæcology, as in most departments of medicine, the more the general health is looked after the more satisfactory will the case turn out.

The most revolutionary change in treatment, and one we can point to with the greatest satisfaction, is that of peritonitis. Now we understand it better we do not fear to administer the purgatives often found so essential for successful results. Lawson Tait has taught us that the distension after abdominal operations, which frequently is the cause of death, will often yield like magic to a brisk purge; and the mistake of locking up foul excretions by the opiate treatment is fully apparent when the two methods are tried side by side. This is not the place to go into the *pros* and *cons*, but I can speak from my own experience of the almost miraculous results of free purgation in seemingly desperate cases, and the cessation of the more urgent symptoms which follows its use.

When we look back through the last few years, the triumphs of special surgery give cause for great satisfaction. Keith has shown us that with the extra peritoneal treatment of the pedicle hysterectomy for fibroid is not the dangerous operation it was formerly. His 38 cases with but three deaths are matter for just pride. Lawson Tait is

the pioneer in removing the uterine appendages as a means of relief in fibroid. He has had many followers, and his experience has amply justified this method, relieving as it undoubtedly does many cases with less risk to the patient than by the removal of the tumour itself. In the happily rarely necessary operation of Cæsarian section Porro's modification has been a marked advance. Apostolis' method of treating fibroids by electrolysis—his paper on which has recently been read before the British Medical Association in England—opens up a new and hopeful field for the cure of fibroids and other diseases connected with the pelvic organs unattended by many of the risks which of necessity must accompany operation, besides having the additional advantage of leaving the patient still capable of child-bearing. That it is going to be the universal panacea for all the ailments of women is very much to be doubted, but that it will be of the greatest aid in many of them is very certain.

Oöphorectomy, which, on its first introduction by Batty in America, was looked upon with the greatest horror, from the sentimental idea that it unsexed the woman, is now fittingly appreciated, and it should never be forgotten that it should only be done in cases of diseased ovaries. It is perfectly obvious to any one that an ovary is diseased when it is the size of the patient's head. But is it necessary to delay operations until it attains this dimension, when it can be ascertained with certainty that, though still small, it is useless as a procreative organ, and only entails excruciating suffering on the patient? The justification of their removal is shown by the numerous instances in which the invalid of years is restored to health and comfort in a few weeks. No one regrets more than the operator the necessity of removing small ovaries, but the instances in which it is done are very few where the patients have not been under various medical men sometimes for years. I myself do not like it, and should be only too pleased if I could justifiably bring myself to think that they are better left alone. At present I cannot do so. Removal of the ovaries for nervous affections, such as hysteropilepsy, is, I believe, going too far, and, in my opinion, should not be done. What to do with prolapsed ovaries is often a puzzling question. The intense misery they sometimes cause is unbearable. I have on several occasions removed them by the vaginal method, and in every case I found them enlarged and diseased. In those cases in which they are healthy, and where the trouble arises solely from their malposition, I am inclined to think as the method (so often highly extolled) of restoring them by the Genu pectoral position is so rarely successful, that it need hardly be taken into consideration as having any really practical results—that abdominal section, and

fixing the ovary in position by means of a gut suture, would be a justifiable proceeding. In one of the latest works on disease of women—that of Thorburn—he states that he cannot imagine how it is possible to remove the ovaries *per vaginam*. Nothing is easier; but the disadvantage is, that the same facility for visual examination of the whole pelvic viscera is not afforded as in abdominal section, though that, perhaps, is counterbalanced by the fact that the patients all recover who are operated on by the vaginal method. The drainage being at the most dependent part, all you have to do is to keep the opening into the peritoneum patent, and you need not trouble about a septic state of the vagina.

The question of operative treatment in cancer of the uterus is one which of late years has attracted considerable attention. This disease is undoubtedly the most distressing with which the gynæcologist has to deal. Patients as a rule come in too advanced a stage for us to deal with it in a manner precluding recurrence. In those cases in which the disease is strictly confined to the uterus, I believe that its extirpation will give better results than are found in cases of removal of the breast for the same cause. To ensure a good prospect of non-recurrence it is necessary that the uterus be freely moveable and the neighbouring parts uninvolved, and in such cases only is it advisable to operate. Of the two methods, namely, Freund's, by abdominal section, and the other *per vaginam*, the latter is incomparably the better. Though tedious and more or less difficult it is very safe, and death is nearly always due to some accident during the operation.

Emmett's name is a household word amongst us, and we have much to thank him for. His operation for laceration of the cervix, which is an inestimable boon; and his latest operation, that for the repair of the pelvic diaphragm, which will prove of even greater benefit to many suffering women, places him among the benefactors of humanity, owing to the incalculable misery of which women are relieved by them.

We are much indebted to Alexander for his simple and rational treatment of backward displacements and prolapse by the shortening of the round ligaments. The relief afforded in these cases is fully appreciated by the patients.

Too much importance cannot be attached to special education in gynæcology, and though it is not for every practitioner to take it up as a specialty, it is almost impossible to realize the advantages which are felt by a man during his practice who has devoted some extra attention to special training. So much of the domestic happiness of the world depends on the health and well being of the wife that it really brings it to the foremost place in medicine.

Though I have not been able to do more than touch upon a proportion of the advances that have been made of late years, I think the subjects I have mentioned are the most important. Papers will be read on some of them, and thus ample opportunity will be afforded for discussion. As regards the present state of gynæcology in these colonies I may say that with the exception of Apostolis' treatment all these operations have had the test of trial and with great success, and there is full evidence that though so distant from centres of thought in the old world we can congratulate ourselves on having kept well abreast of the times.

OÖPHORITIS AND ITS RELATION TO OÖPHORECTOMY.

[By J. O. CLOSS, M.B., Ch.M., Invercargill, New Zealand ;
Hon. Surgeon Southland Hospital.]

Mr. Chairman and Gentlemen—With your kind permission I will claim your attention for a short time to the subject of my paper on oöphoritis and its relation to oöphorectomy, concerning which at short notice I have undertaken to say something.

During the reading of the paper many defects may be noticed, and much may be said with which some will disagree. With regard to the defects, I may say at the outset that I do not set myself up on any stronger authority than that I have gained from limited personal observation and experience.

If on the other hand there are any present who will not entirely agree with all I may say, I trust at the conclusion of the paper they will express their ideas in free and unlicensed criticism.

Some might wonder at my bringing up such a subject at all, a subject which in one or other of its phases nearly every practitioner has to deal with at some time or another, and in many instances very frequently.

If, then, any excuse or excuses were necessary, I should find a very strong one in the frequency of this affection, and in the difficulties and disappointments which generally surround its treatment.

You have it on the authority of very eminent gynæcologists that it is a difficult affection to cure. Of the chronic form Dr. Matthews Duncan has said that he could only hope for a cure, and Barnes even in a more doleful sentence has said that the girl who starts with dysmenorrhœa is doomed to suffer for years, perhaps for life. Prof.

Thomas says "I know of few curable disorders which I dread so much to meet as this." When such gynæcologists as those I have just mentioned are so doubtful as to the success of their treatment, what is to be expected of men of less experience and ability?

Some might say, leave them alone. Others give them sedatives, and enjoin perfect rest, &c. This is what has been done principally in the past. It is the teaching of most of the authorities on the subject; but it practically amounts to saying to the patient, I can do but very little for you; I am very doubtful if I can hold out a cure satisfactory either to you or to myself. I do not say that it happens absolutely in every case of oöphoritis, but in the chronic form it is not an over-drawn picture; it sometimes happens.

There are cases I admit in which much can be done both in relieving suffering and leading on to a probable cure, but there are forms of chronic oöphoritis in which the ovaries have undergone tissue changes amounting to a disease, and which no therapeutical agency can ever hope to cure.

How is it that these organs, liable as they are to so great and frequent physiological changes, liable to such important and serious displacements, liable to injury and inflammatory attacks from various causes, have not received the consideration in their treatment commensurate with their pathological condition. Probably it may be accounted for from the difficulty that is sometimes met with in diagnosing diseases of the ovary, from the dread of opening the peritoneum, from the difficulty of verifying diagnosis by post-mortem examination, and from the knowledge, no doubt, that mere inflammatory attacks of the ovaries are not in themselves absolutely dangerous to life any more than that their presence is absolutely necessary to sustain it. Such considerations, no doubt, have helped to throw as it were a shade of "no importance" over the ovaries, thus retarding a proper pathological knowledge of the diseases of these organs, and so as a consequence their treatment.

Pathology, I am glad to say, is now beginning to throw some light on diseases of the ovaries. It is beginning to be recognised that these organs take on diseases other than the usual cysts and solid growths, which formerly occupied the mind of investigators, to the exclusion of the minor diseases—minor only in the sense that they did not seem to demand the same amount of attention in order to give them their proper place in the science of gynæcology. Let us hope that this investigation shall go on and prosper, that the pathology of the ovaries shall become a recognised chapter in all text-books on the subject, that it shall decide once and for all whether these organs in a state of disease shall be removed or not;

for here let it be clearly understood that it is my opinion that the propriety or otherwise of this operation is not to be decided on ethical grounds, but on a true and scientific basis of pathology.

If, then, gentlemen, you will admit such statements as I have made, you will readily allow that such a subject may justly claim your consideration for a while, and I make bold to hope for your free unbiassed criticism.

Before proceeding further, however, I wish to recall to your mind the anatomical distribution of the ovarian blood vessels.

The ovarian arteries springing directly from the aorta at an acute angle it is easily seen that a strong arterial wave is washed into the ovarian capillaries, and owing to the difference both in structure and disposition of the ovarian veins, the facility for the return of blood is different on each side. That from the right ovary is very materially assisted by means of its vein entering the inferior vena cava at an acute angle, its opening guarded by a valve, while on the other hand the return blood of the left ovary is not so assisted, on account of its vein opening into the left renal vein at right angles, and according to Dr. Brinton, of Philadelphia, unguarded by any valve. From this anatomical defect or absence of a valve at the junction of the left ovarian and renal veins it is clearly seen that the left ovary is liable to a greater amount of passive congestion than the right, and clinical experience justifies this view.

As the ovaries are the organs principally affected in all women at the catamenia they necessarily undergo certain normal physiological changes, which in some cases amount to an abnormal hyperplasia; the ovaries become enormously congested, their veins enlarged. The superabundant blood supply must get away by other means than through the veins; if this cannot take place there is, as it were, a regurgitation back on the ovaries, inflammatory action ensues, with hypertrophy of the organ. This condition may repeat itself again and again, so that finally the natural physiological function of the ovary is utterly destroyed.

If on the other hand there be no obstruction to the blood flow by the natural channels, it is generally found in such cases of ovarian activity that the sanguineous discharge is free and copious, giving rise to no more discomfort than a feeling of weight and tenderness in the region of the ovaries, and probably a sensation of weariness from the loss of blood. In such a case the ovaries present a condition of affairs closely allied to acute oöphoritis. It is generally found in young emotional girls. I have also found it often, I may say, in young married women, and sometimes in mothers of one or more children. It is an abnormal hyperæmia of the ovaries, and if not

arrested will have a tendency to induce ill-health, principally from anæmia, or perhaps what is worse, pass into the chronic state of oöphoritis, with probably a dislocation of one or both ovaries into the *cul de sac* of Douglas.

Mr. Lawson Tait is the only author I am aware of who has separated this condition from acute oöphoritis and given it a class of its own.

Barnes, however, has recognised this condition of the ovary when speaking of a case under the head of dysmenorrhœa. He said that the flow was indicative of more than a simple hyperæmia of the ovary. Clearly, therefore, he recognised a hyperæmic state of the organ as distinct from acute or chronic oöphoritis, but has not considered it of sufficient importance to give it a distinct class.

Atthill has said—I am satisfied that a condition of ovarian irritation short of actual inflammation, but in which there is a certain amount of congestion present, is not an infrequent cause of menorrhagia.

Mr. Tait has used a term which I think fully explains many cases which, not exhibiting sufficiently pronounced symptoms to classify them under acute oöphoritis, yet possess sufficient indications to show that they are closely related to that disease.

As far as my experience goes the majority of women who have consulted me have been married, and some of them, as I have said, the mothers of one or more children; and I am thoroughly convinced from the examinations to which I have subjected my patients that menorrhagia can be caused by other means than tumours, polypi, sub-involution, displacement, malignant disease, or chronic inflammation of the ovaries. In nearly every case they complain of a dull heavy feeling in the region of the ovaries, tender on pressure, and on examination per rectum the ovaries are found swollen, and very tender to the touch, and apparently everything else about the pelvic organs quite normal, although I could not be certain but that some of them at one time or other might have had an attack of pelvic peritonitis of more or less severity. Therefore diagnosing, by elimination, it is quite clear that the ovaries are the offending bodies, and if they have not taken on the acute form of oöphoritis they are at any rate in that state designated by Mr. Tait as simple hyperæmia.

The cause of menorrhagia in young girls and in some married women too I think is due in a great measure to a high-strung emotional temperament in which the sexual emotions play a most important part. Whatever these patients or their friends may think to the contrary this psychological factor must be taken into consideration. I have found good doses of bromide with nitrate of silver

or ergotine and perfect rest at the time of the catamania very beneficial. It may, however, be necessary at times to interfere with such patients social habits and pastimes, and if not absolutely prohibit all such as are likely to abnormally excite the emotions, at any rate a considerable restraint must be exercised, or therepeutical treatment will be all in vain.

I have mentioned this hyperæmic condition of the ovaries because I recognise in it a factor in the cause of acute oöphoritis, and its discussion a fitting introduction to that phase of the disease.

What pathology we do know regarding acute oöphoritis goes to show that it is the follicles of the ovary that are principally affected. There is, however, another form of inflammatory action of the organ in which the stroma or interstitial element is the part affected, but even in this latter form I am inclined to think, and both the physiological action and anatomical structure of the organ will support the theory, that the interstitial form is never a primary inflammation, especially when it (the inflammation) starts *de novo* in the organ; or the result of continued hyperæmia, but is secondary to the inflammation and destruction of the follicles. It is probable, however, that both forms of inflammation may take place simultaneously in the organ when the cause arises from some form of pelvic inflammation setting up first of all, perioöphoritis which may spread to the stroma and the follicles, or the latter may become affected by the excessive hyperæmia of the organ. In this way I can conceive of both forms of tissue change taking place at the same time, and when the process has progressed so far as to destroy the follicles and set up a proliferation of interstitial tissue it has passed from the acute to the chronic form. We know for a certainty that the interstitial tissue largely predominates in chronic oöphoritis and this is invariably verified by the actual specimens when such can be procured by operative means or at post-mortems. The specimens obtained by operative means are preferable, because they are then unaffected by any other disease which may prove fatal and which might alter the condition of the ovaries prior to death. I have here two specimens of ovaries which I removed from patients who had suffered for years from chronic oöphoritis, and you will see that the interstitial element is largely predominant, indeed there is nothing else to be seen except a few cysts, which are probably the remains of over-distended follicles.

We can all see the difficulty there is in getting a true pathology of the acute form of oöphoritis. The organs are never removed for that phase of the disease, so that the only information we have concerning it must come from the post-mortem room, and this is not satisfactory for the reasons I have just given.

Again, I believe there are a large number of post-mortems made in which the ovaries are never looked at from the reason that there never was thought to be anything the matter with them during life. Prof. Thomas has given us a table taken from Henning in which he says that out of 100 necropsies, in 10 diseases of the ovaries could or were made out during life; and again, out of 81 necropsies there were 53 cases of diseased ovaries which were not diagnosed during life.

As regards the etiology of acute oöphoritis, one probable cause I mentioned when speaking of the excessive hyperæmia of the organ. If this be so, I should be inclined to take it as a form of inflammation originating within the organ itself, a condition of affairs which most authorities on the subject agree in saying is extremely rare. As far as I am concerned myself I must say that I have not yet had a sufficient number of cases or sufficient experience to speak with any decided tone on this point.

We are all aware that injury to the ovary, gonorrhœa, pelvic peritonitis, pelvic cellulitis, and such like direct or indirect causes, are often the immediate excitants to an acute attack of oöphoritis. I cannot remember ever having met a case arising from direct injury of the ovary. These organs are so well protected from external violence that an inflamed condition from that cause must be very rare. I have to my knowledge met with one case of bad oöphoritis arising from latent gonorrhœa in the male, and as the case is an interesting one I will give you its history in as few words as possible. Some time before marriage the husband contracted a gonorrhœa. He understood himself to be cured, and that no harm could come of getting married. A few days after marriage the wife was seized with a severe burning pain in the region of the left ovary, which ultimately compelled her to seek medical advice. From then till the time she came under my care, which was nearly two years, she was more or less an invalid. At the time of her catamenia she suffered a great amount of pain, laying her up in bed for several days. On examination both ovaries were very sensitive to pressure, the left more so. This could be felt per rectum to be enlarged, somewhat flabby, and exquisitely tender. The catamenia was irregular, very profuse, and caused, as I have said, great pain. The uterus slightly anteflexed; at times she would suffer from pelvic peritonitis, during which attacks the right ovary felt painful. After a severe attack of pelvic peritonitis a pyosalpinx formed in the left Fallopian tube. During this attack the right ovary became decidedly affected, and was even more painful than the left. The next time her menses appeared there was some pus, and at the end of a week

nothing remained but a purulent discharge. The distended Fallopian tube could still be felt, and to assist the discharge I inserted a hollow stem pessary into the uterus, and there followed a free and copious discharge of pus, whilst the pyosalpinx gradually got less. For a fortnight or three weeks she improved rapidly, then on account of family affairs went to another town. The next thing I heard was that the pyosalpinx had again appeared, and that the same treatment was adopted as before.

This case presents several points of interest. First, there was acute oöphoritis in the left ovary, caused almost for a certainty by gonorrhœal germs latent in the male. Then there were the acute exacerbations in which the right ovary became involved, perhaps at first from sympathy, latterly perhaps from absorption of septic matter, or perhaps from the spreading of the peritonitis, or may be all combined. Then the formation of the pyosalpinx, which might have been the result of the severe peritonitis, or having a septic origin. Then there was the pyosalpinx discharging through the Fallopian tube and uterus.

The last I heard of the case was from the medical gentleman in attendance, who informed me that she was doing very well.

As to the ultimate result in this case I am very loth to hazard an opinion.

Acute oöphoritis may arise from mechanical obstruction to the menstrual flow, an obstruction either in the uterus or Fallopian tube. When there is obstruction in the Fallopian tube, it may arise from some error in development, or adhesions resulting from past peritonitis. If from the latter, I am inclined to think that the ovary did not wait till the Fallopian obstruction was formed, but took on the inflammatory condition as a consequence of the pelvic peritonitis. Therefore it is impossible to say how much the oöphoritis is due to the Fallopian obstruction or to the pelvic peritonitis. At any rate, once the Fallopian obstruction is formed, it is almost certain to cause an acute inflammatory attack of the ovary at every menstrual period, and if allowed to go on month after month, it is almost certain to end in chronic oöphoritis.

In a number of cases of chronic oöphoritis operated on by Mr. Lawson Tait one or both Fallopian tubes was found to be constricted or adherent to the ovary. There is also one case in which this condition was found reported by Dr. Raleagliati, of Bedford Infirmary, in the December *Lancet* of 1884.

I also found this condition in one of my own cases, and the specimen is here for exhibition.

When the mechanical obstruction is in the uterus, it is, as a rule,

found in one or other of the flexions, or in partial or complete atresia of the os. This form of dysmenorrhœa has been classed by one author at least, as uterine colic, his theory being that the retained blood is unable to pass out on account of the uterine obstruction, and pains are set up in the uterus by its efforts to eject the pent fluid. This, I am convinced, is not always true. The same author, *i.e.*, Barnes, at another part of his book, when speaking of ovarian dysmenorrhœa, says that the ovarian distress accompanies the uterine distress; but even in such cases the ovarian symptoms take precedence in time. Here, then, is a clear statement made by a distinguished gynecologist that in uterine obstruction the ovaries are the organs first involved; in other words they are the seat of pain, and not the uterus. I do not mean to say that there never is any pain in the uterus, but I believe that in the majority of cases in which uterine pain is a feature, that it is due to the contractions of the organ set up reflexly by ovarian irritation, and always due to the retained menses. Why is it that in some cases of dysmenorrhœa, when there is uterine obstruction, and just before the menstrual discharge takes place, there is severe pain both in the region of the ovaries and uterus, and after the discharge is established there is no pain in the uterus, and only a dull aching feeling in the region of the ovaries. It is clear that the mechanical obstruction in the uterus could not have been the sole cause of pain in that organ, otherwise the pain should have lasted as long as the menstrual flow, which it did not. Again, if the pain were due to retained menses, the pain should disappear and the menses come on when a uterine stem is introduced. By that means it is often found that the pain is much relieved, but the menses do not come for several days. It would therefore appear to me that in flexions of the uterus at any rate there is a dragging and strain put upon the Fallopian tubes and ovarian ligaments setting up a great amount of congestion and irritation in the ovaries, which acts reflexly on the uterus, often causing the uterine colic. I would not say that too much attention has been given to the uterus, but I would say too little has been bestowed on the ovaries. As regards atresia of the os uteri affecting the ovaries, I could not do better than give the particulars, as short as possible, of one or two cases that have come under my care. One in particular is very interesting and instructive. It was that of a lady, age 27, married seven years; but never pregnant. She commenced her menstrual life at the age of twelve years, and from the very first suffered excruciating pain in the region of the ovaries at every period; finally pain was her constant companion. Her menses were very scant, never lasting more than two days. She had tried many

doctors and great varieties of treatment. On examination she presented the pin hole os and a conical cervix. Her ovaries could be felt with difficulty; they were very small, firm, and tender. I divided the cervix with the metrotome, and passed into the uterus a solid vulcanite stem. Shortly after, her pain was considerably less, which I can only account for by the stem rectifying the ante flexion, which was very pronounced, and preventing the uterus dragging on the ovaries. She wore the stem for three weeks before the menses appeared, and then, for the first time in her life, they were painless, and lasted five days. Here is a clear illustration of a double obstruction, causing excruciating pain. The pain could not have been due to uterine contractions throwing off the retained menses. If that had been so these would have escaped on the introduction of the stem, but they did not appear until three weeks after. In this case it is clear that the ovaries were the affected organs, and the right seemed to be the worse, for this exhibited a greater amount of tenderness than the left when pressed upon.

On the afternoon of the fifth day of her menses I removed the uterine stem, and next morning all traces had disappeared. Two days after she developed a severe attack of pelvic peritonitis. At first I thought this must have something to do with the stem, but I learned from her that the day previous she had changed heavier clothing for a lighter material, and exposed herself to a cold wind. This, at any rate, I accepted as a reasonable cause. She slowly recovered from this attack, similar to those she had frequently suffered from before, and in which the ovaries were undoubtedly involved. Before she was perfectly well and had again menstruated, she was forced by family affairs to go to her distant home. I feel certain in this case I cannot hold out a favourable prognosis. It is, however, very instructive. She must have passed through the hyperæmia of adolescence to acute oöphoritis, finally turning to the chronic form, with atrophy of the ovaries and frequent attacks of pelvic peritonitis, of which the oöphoritis may be the cause or the consequence. It is also instructive that in all cases of severe dysmenorrhœa unamenable to the usual form of treatment an examination should be insisted upon, or no responsibility assumed by the medical attendant.

Barnes lays considerable stress on this point when he says that many of the abnormalities of the ovaries and Fallopian tubes, especially inflammatory adhesions and altered conditions of the ovaries are in consequence of the narrow os uteri, and might have been prevented had the obstacle to menstruation been removed at an early period of life.

Two other cases of a very similar nature to the one just mentioned came under my care, aged respectively 22 and 20, both married. They both complained of scanty menstruation and very severe pain in the region of the ovaries. They both had antelexion and the pinhole os. Both were submitted to the same treatment as in the previous case. At the end of three days the one menstruated freely and painlessly, the other not till two weeks, and then only slightly; but in a month from that she menstruated freely and painlessly.

The stem was retained in each case without any discomfort till they had each menstruated three times, when it was removed, which in the one case is four months ago and in the other three. Since then each has menstruated regularly, and without pain.

Numerous cases of scanty menstruation, accompanied by severe ovarian pain have come under my notice, and I have invariably found some uterine obstruction, which, when removed, allows normal menstruation.

From such cases it might be thought that the uterus is the cause of all the mischief. Uterine obstruction, therefore, is of considerable importance. Not in itself, but it is full of terrible consequences to the ovaries and their surroundings. Dr. Benj. Hart asserts, in his "Female Pelvic Anatomy:—" "A flexion of itself is of no consequence, and because antelexion is often associated with dysmenorrhœa it does not follow that it is the cause of it." I am inclined to think that flexions are only important when they affect other organs, and I take it that the ovaries are the organs most affected by such abnormalities.

In most cases of dysmenorrhœa the ovaries are not taken into sufficient consideration; indeed, they are often entirely overlooked, the whole energy of treatment being expended on the uterus, under the impression that the pain is uterine colic, or mere ovarian neuralgia, caused by the difficulty of the menses passing through the obstruction, or their complete retention. So the treatment is confined very often to the administration of drugs and hot baths. In cases of a mild form such treatment as this may be advocated till nature has righted herself if she can, but in severe cases, to delay examination and rectification of the obstruction is a fatal mistake, and the ovaries are the organs that will afterwards tell the tale. If this could be always kept in view there would be fewer cases of chronic oöphoritis, a form of the disease which we must all admit is very frequently met.

On account of the many forms of inflammation that are liable to take place within the female pelvis it often becomes a matter of difficulty to make an exact diagnosis. Chronic oöphoritis, according to

those best able to judge, is often surrounded by complications of the most severe nature.

We can all easily understand that when the ovaries have been subjected to repeated attacks of inflammation they must soon become altered both in structure and physiological function. This alteration must necessarily set up concomitant symptoms, not only confined to the diseased parts; but often widely reflex, and thus numerous symptoms are produced going far to obscure the case.

As far as my own experience teaches me the most distressing symptom in chronic oöphoritis is bodily pain. This is located principally in the region of the ovaries, in the back, and down the thighs, and seems to be with the patient more or less always. The mind, too, is not always exempt, the most marked mental symptom being melancholia, no doubt a production of the continued pain. Sometimes epilepsy is said to accompany ovarian pain.

I have met one case in which there is an undoubted relation between the fits and the state of the ovaries. She has suffered for years from dysmenorrhœa. When she came under my care she had a very pronounced ante flexion of the uterus, which was amenable to treatment that did good as far as menstruation was concerned, but the pain in the region of the ovaries remained, and at her usual periods her fits are more frequent and more violent than at other times. There is no family history of fits, insanity, or drunkenness. Bromide and other sedatives have little or no effect on them.

I feel convinced she suffers from chronic oöphoritis, and that the removal of her ovaries would probably cure both her pain and her epilepsy.

It is idle, however, for me to take up your time on the symptoms of this affection, which must be familiar to you all. One more symptom I should like to mention, and that is the hæmorrhage. Not only as a rule is there dysmenorrhœa but menorrhagia. Of course, if the case be one in which there is obstruction of the Fallopian tube or stenosis of the cervix, as in a case previously mentioned, there may be even amenorrhea.

The pathological appearance of chronic oöphoritis is well marked in the great increase of interstitial tissue. Sometimes the organ is enlarged, sometimes it is atrophied. Both conditions are well illustrated in the specimens I have here, resembling very much cirrhosis of the liver. Sometimes cysts are to be found both in the substance and on the surface, sometimes abscesses, when the latter the ovaries become as a rule very much enlarged. The surface presents a somewhat knobby appearance—deep impressions with corresponding ridges, on the whole giving one the impression of a

somewhat hard, tough, leathery substance. This is very much the appearance of the specimens, and corresponds in a high degree with clinical descriptions given by Mr. Lawson Tait, who must be recognised as an authority on the subject, as probably no other man has excised so many ovaries as he has.

We owe a high sense of gratitude to the recent investigators of the pathology of the diseases of the female pelvis. They have done much to make diagnosis more certain, and point out a rational line of treatment. As regards the etiology of chronic oöphoritis one might say, and justly too, that it is as numerous as its symptoms. Of one thing I am convinced, that frequently the true cause is never made clear and definite. If a patient suffering from this affection be asked what the cause was her answers are indefinite. Maybe she suffered from the time her last child was born, or maybe from the last miscarriage, or perchance she connects it with some fall or an attack of inflammation. Others again, and especially those who never have had children, who have suffered for years, cannot associate any particular circumstance with the beginning of their misery. The history of one of my cases corresponds exactly with this. She was married eight years, never pregnant, had suffered pain before marriage, but for the last five years it had been much worse, and was now unbearable. Pain and menorrhagia were the chief features in this case. She could mention no likely cause for all her suffering. She had retroflexion of the uterus and prolapsed ovaries. The retroflexion might be taken as the starting cause, acting as an obstructive to the menses, the prolapsed condition of the ovaries only making things far worse. After much consideration and failure of the usual remedies to give any relief, her ovaries were removed, and she is now in excellent health and has no pain.

Another patient came under my care suffering from dysmenorrhæa and menorrhagia, and had done so for some considerable time. She had been married four years; was never pregnant. Occasionally she had attacks of severe pelvic peritonitis. The menorrhagia at times was most alarming and the pain excruciating.

After several months she gradually recovered sufficiently to walk a short distance. The pain, however, although of less severity, never entirely left her, and her constitution had become very much affected. She was somewhat averse to an operation, believing that in time she would quite recover, and that a sea voyage to England, where she wished to see her friends, would brace her up.

She took passage in a steamer, and towards the end of the voyage felt very ill again. She landed amongst her friends almost as an invalid. Mr. Lawson Tait was called in consultation to see the

case, as was also Dr. Savage. Both advised as the only remedy removal of the uterine appendages. This operation was performed by Mr. Tait, after the husband had cabled his consent. The patient made a good recovery, and returned to the colony in excellent health in less than nine months from date of departure. It is now over a year since the operation, and she still enjoys good health, and suffers no pain.

These, gentlemen, are cases of chronic oöphoritis found in married multipara which came under my own personal observation, and on whom oöphorectomy was performed, followed by splendid results.

I just wish to mention one more case. It is that where chronic oöphoritis was found in a pluripara. Pain and frequent menorrhagia were the grave symptoms. Everything was done that could be done short of operation, but without any good results. I advised removal of the ovaries as the only thing likely to do any good. She freely consented, preferring to die rather than live a life of misery. Accordingly I removed both ovaries and the left Fallopian tube, as this was adherent to the ovary and broad ligament. I have the specimen here for exhibition. The patient, with one or two interruptions, due to external circumstances, made a rapid and complete recovery, and as far as I know now, is in good health, and free of pain.

These cases I have just related are those which have come under my own personal observation and experience; it is not theorising. They speak for themselves, and the pathological specimens can tell their own tale. In such cases I am sure you will perfectly agree with me that therapeutical agencies cannot have the slightest beneficial effect. They are beyond such ordinary treatment; nothing but the total extirpation of the diseased organs can avail. You will note that such ovaries are not removed because they are merely offending bodies, for which Dr. Batty first removed them; but they are actually diseased, just as much as cirrhosis of the liver and kidney is a disease.

I believe that in cases of chronic oöphoritis there is often a great deal of unnecessary pain inflicted by means of blisters and such like counter irritants over the ovaries, with the hope of doing good, it cannot be with the hope of effecting a radical cure; of that more than one gynaecologist has said there is very small hope indeed. In such cases, too, pelvic peritonitis is nearly always more or less a latent affection, only existing for some exciting cause, and this is sometimes found in the treatment of the case, especially so in endeavouring to rectify severe flexions of the uterus. I met one case of chronic oöphoritis in which the retroflexion was so great as

to bring fundus and cervix in contact. She at times suffered from profuse menorrhagia and intolerable dysmenorrhœa. This had gone on for two years, whilst the uterus felt as hard as a cricket ball. To attempt to rectify a flexion of this nature, surrounded by most unfavourable conditions, with the hope of effecting a cure of the ovaries, would be, to say the least of it, a difficult and dangerous proceeding, whether the cutting operation was performed on the knee of the flexion or the use of pessaries and tents adopted, there would be great danger of setting up pelvic peritonitis.

Granting, on the other hand, that the flexion is rectified, would the disease of the ovaries be cured? I think not. The disease is not in the uterus, and such means can only act indirectly on the ovaries at best. I again assert my opinion, with Dr. Benjamin Hart, that flexion of the uterus in itself is of no consequence. Once chronic inflammation has taken a firm hold on the ovaries, with change of tissue—and this change of tissue must take place rapidly from the great blood supply to the organ—I believe that anything done to the uterus will have a negative result as regards curing the oöphoritis, but on the other hand may do a deal of harm. This treatment has been taken too late in the day, so to speak. Had it been adopted before the ovaries became so deeply involved some good might have followed. It is therefore important to look for uterine obstruction early, and to rectify it at once. By this early and decided treatment I think many a case of chronic oöphoritis might be warded off. The whole mistake lies in supposing that the patient's state is due entirely to the condition of the uterus, and that often mere palliative measures are adopted, while scarcely a thought may be directed to the condition of the ovaries, which, of course, should be the first consideration. I therefore maintain that more attention should be given to the disease of these organs in order, if possible, to keep it within due bounds, for once the disease has obtained a mastery the patience and skill of the medical attendant will be put to the test.

Do not, however, for a moment imagine that even in severe cases of ordinary oöphoritis all treatment must result in doing nothing. In severe cases much can be done, and is done, by the ordinary means now at our disposal. On the other hand there are cases in which no ordinary means can have the slightest benefit. Where the line shall be drawn I cannot tell. One thing to me is very evident, that there are cases in which nothing will effect a cure but complete removal of the ovaries. Of this every surgeon must be sure who shall undertake the responsibility of the operation. How he shall be sure must rest with his own powers of observation and diagnosis. In the present state of our knowledge on the subject there is no infallible

guide; but I should say when the surgeon has tried every thing in his power short of operation and brings no relief; when the patient is dragging out a miserable existence, and her life may be said to be in danger at any hour, either from hæmorrhage or peritonitis, the operation is justifiable. If we had more experience and more pathological knowledge on this vexed question many years of suffering might be saved the patient, for it might then be known for a certainty that to delay the operation would be more than useless.

Some may object on the ground that the operation may kill the patient; the only feasible objection I know of against the operation. To which I would say of course the operation may kill the patient just as any other operation may, but we know perfectly well from the statistics of abdominal surgery that the death-rate from this operation is as low, if not lower, than any other major operation in surgery. Many surgeons have not yet got over the dread of cutting the peritoneum—a dread which is only justifiable where the operation is unjustifiable.

Mr. Wheelhouse, in the *British Medical Journal*, in speaking of oöphorectomy, says:—"The ovaries may be so affected as to render life wholly unendurable, it then becomes a simple duty to remove them; a duty from which no conscientious surgeon of the present day will shrink."

Mr. O'HARA had removed several ovaries, and had sometimes regretted it. To unsex a woman, especially when married, was a very serious matter, and it was to be remembered that much ovarian irritation was consequent on uterine disease. Ovaries, the seat of malignant disease, should of course be removed. He thought that in this hot climate most pluriparæ suffered from subinvolution.

Dr. GARDNER held that the removal of diseased ovaries did not unsex the woman, and that the sexual appetite in abeyance from such disease was restored by operation. It was of course necessary to treat any concurrent uterine disease before proposing oöphorectomy. He found flexions and versions of the uterus very common, but did not advocate their treatment unless causing serious symptoms.

Dr. CHAMBERS wished to thank the author for his excellent paper, and spoke deprecating the operation of oöphorectomy except after the most careful scrutiny of the case. He considered it the simplest of capital operations, but not one to be performed in the hot season. He had operated thirty times, and had lost one patient.

Dr. MAUNSELL agreed generally with Dr. Chambers, and would not operate except in cases where life had become a burden or the mental powers were failing, nor without months, or even years, of careful treatment.

Dr. PINNOCK pointed out the difficulty of carrying on long continued medical treatment in chronic ovarian cases, and spoke specially on the complications during operation caused by adhesions.

Dr. WAY mentioned a case of death from tetanus in his practice, following excision of the ovaries.

Dr. CLOSS, in replying, said cases of chronic disease of the organs, with impaired mental faculties, were with ovaries the seat of malignant disease, specially suitable for operation. Sexual desire, abolished generally by disease, was restored after operation. The mortality he considered low as compared with other major operations.

THE HISTORY AND PROGRESS OF OVARIOTOMY IN THE AUSTRALIAN COLONIES.

[By ROBERT DENHAM PINNOCK, M.B., Ballarat, Victoria.]

The paper which I have this day the honour of bringing before the Congress being almost entirely of a statistical nature is not likely to evoke the amount of interest and discussion which others will do.

Knowing the dread with which those who deal with any subject by tables of dry figures are regarded by most of their fellow beings, I must crave your indulgence and patience whilst listening to the following deductions.

The universal interest which has of late years been evoked by the continuous and steady advance in the means of diagnosing, and methods of operating for, ovarian tumours, as well as by the regularly diminishing death-rate in the hands of those distinguished surgeons of the old world (particularly those of our own mother-country) has led me to take up the subject of the history and progress of ovariectomy in the Australian colonies. And it seemed to me that as no previous attempt—so far as I am aware—had been made in this direction, that it would be a fitting paper for the *first* Medical Congress in Australia, and peculiarly appropriate at this meeting on account of the *first successful* case of which I can discover any record having been performed in this city as long ago as the year 1852, by a respected gentleman now with us—I allude to Mr. George Mayo, F.R.C.S.—and he tells me the woman still lives in the neighbourhood of Adelaide, and is active and strong. At the time of the operation she was 40 years old, and had seven children. She had been tapped three times. The tumour, which was non-adherent, multilocular, and partly ossified, weighed four pounds, and was removed under chloroform, through a long incision, the pedicle being secured by a double silk ligature through and

round it, and dropped into the abdomen. The wound was not touched for four days, and then dressed on every second day. She had an opiate after the operation. There was very slight shock or pain afterwards, and only slight vomiting and flatus on the second day. The bowels were opened by enema on the third day. She was allowed get up in four weeks, and the report states that she jumped a four-rail fence on horseback soon after. I have detailed this case at some length in order that the treatment adopted by Mr. Mayo 35 years ago may be contrasted with that in fashion in more recent times.

The undertaking of this case by Mr. Mayo reflects all the more credit upon him as the operation was not in very good repute at the time in Great Britain, ovariologists having been stigmatised as "belly-rippers" by the late Dr. Robert Lee.

The next case recorded was attempted in the Melbourne Hospital by the late Mr. Edward Barker, F.R.C.S., Lond., and Lecturer on Surgery at the Melbourne University, in September, 1859, but had to be abandoned on account of the density of the adhesions, the patient dying of shock in twenty-five hours.

In connection with this case Mr. Barker says:—"The ovariectomy statistics, collected by Dr. Lyman, up to 1856, embraced 300 cases, and the analysis showed that in three-tenths of the cases the operation could not be completed. The rate of mortality for the 300 cases was 40·13 per cent. In the completed cases it was 42·78 per cent. In the uncompleted cases it was 30·68 per cent. Less than three-fifths of the whole number of operations undertaken recovered. Adhesions caused the abandonment of the operation in 22·06 per cent. of the whole number, or caused 77·27 per cent. of the failures. No tumour was found in three per cent. of the whole cases operated upon. When complicated with adhesions 47·82 per cent. died; when there were no adhesions 32 per cent. only died." I quote these figures to recall to your minds the surgical position of ovariectomy elsewhere at the period when the first cases were undertaken in Australia.

And now we come to the brightest name in connection with the early history of the operation in these colonies, viz., the late Richard Thomas Tracy, M.D., formerly Lecturer on Obstetrics at the Melbourne University. His first case—a successful one—was done on the 10th March, 1864, at the patient's private residence. She was aged 29, married, with three children, and in delicate health. She had been tapped three times. The tumour was multilocular, semi-solid, and firmly adherent to the omentum, necessitating the removal of a portion of the omentum, and the ligature of five vessels. She was

anæsthetised with chloroform. The pedicle was ligatured with double hemp, fixed with Wells' clamp, and brought out at the lower angle of the incision, which was five and a-half inches long between umbilicus and pubes. Hare-lip pins and fine iron wire used to secure the incision, and warm linseed poultices applied over all. Two grains of opium given after the operation. She was allowed up on the seventeenth day, and her after progress and health were good. Tracy operated altogether on 22 cases with four deaths, or a death-rate of 18.1 per cent. When we find that Sir Spenceer Wells' death-rate for the same period (1863 to 1873) is 25.3 per cent., we can appreciate the immense impetus and encouragement that Tracy's success must have given to Australian surgeons in undertaking the operation. In fact, it cannot be disputed that his early and uniform success helped more than anything else to firmly establish the operation in Victoria, and eventually in the other colonies. His success is all the more extraordinary as he never had an opportunity of seeing the operation performed by anyone before commencing to operate himself, and he approached the task with considerable apprehension, knowing the prejudice against it, and the necessary difficulties surrounding its performance at this remote distance from the old country, where the co-operation of those experienced in its performance could not be obtained. He never refused to operate in any case he met with, and was only once met with a refusal on the part of a patient to submit to operation. He always treated the pedicle by the extra-peritoneal method, and said that though he would not hesitate to drop in the pedicle where it was very short and might be strained by a clamp, his experience would lead him to bring out and clamp every pedicle long enough to be so treated. He invariably used hemp for the pedicle and brought it out at the lower angle of the wound, which he secured by hare-lip pins, including the peritoneum and superficial horse hair or silver wire sutures. He always gave ten grains soap and opium pill per rectum after an operation, and he was always very particular in having the temperature of the operating room kept at 70°-75° F. Amongst the pioneer operators may also be mentioned Mr. McGillivray, of Sandhurst, who operated in November, 1864, Surgeon McKinnon, of New Zealand, in March, 1866, and Mr. Whitcombe, of Ballarat, in January, 1867. At this date ovariectomy may be considered as fairly established in Victoria, although it does not appear to have taken a fair start in New Zealand until 1876, in New South Wales until 1878, and in South Australia until 1876. A few cases only have been done in Queensland and Tasmania, and not any in Western Australia, Northern Territory, or Fiji. And

now having to the best of my ability given you a sketch of the history of ovariectomy in these colonies, I will proceed to tell you the results of my investigations as to its progress.

In the first place then, I have received information from the colonies of Queensland, New South Wales, Victoria, South Australia, New Zealand, and Tasmania, showing a total of 244 cases operated upon, out of which 58 died, giving a mortality of 23·7 per cent. These returns embrace a period of 35 years, viz., from Sept. 1852, to July, 1887, and I feel fairly well assured that another 45 or 50 cases would amply cover all the rest that have been operated upon in Australia in that period. I regret to say that some operators have only been able to furnish me with the number of their cases and the number of deaths, having lost all other particulars and being unwilling to answer from memory the various queries sent to them.

Of the total 244 cases operated upon there were in

Queensland	...	4	cases	1	death	=25 %	mortality,	by	4	operators
New South Wales	37	"	4	"	10.8	"	4	"		
Victoria	...130	"	36	"	27.6	"	24	"		
South Australia	30	"	8	"	26.6	"	7	"		
New Zealand	... 40	"	7	"	17.5	"	15	"		
Tasmania	... 3	"	2	"	66.6	"	3	"		

Included in the above are five operations which had to be abandoned in consequence of the density of the adhesions, four of which were fatal, and in the other the patient recovered.

At first sight viewing this mortality of 23·7 per cent. in comparison with that obtained of late years by the ovariectomists of Great Britain we are naturally struck by our high death rate. But when we consider that this is not the result obtained by one or a few specialists who are daily operating with every condition for success about them in addition to their individual skill and experience, but the result obtained from 57 different operators, some of whom never saw the operation performed, and many of whom may have had to operate under unfavorable conditions, such as small, badly lighted, and badly ventilated rooms, hot wind days, insufficient surgical assistance and unskilled nursing, the result is not so unwarrantably bad as it might appear. In Skene Keith's report of his second series of 50 cases of ovariectomy (*B. M. J.*, Feb. 1887) he says that although the mortality of specialists is reduced to a small percentage, the general mortality in Great Britain is probably nearer 30 per cent. than 20 per cent. If this be the case our Australian results are not to be despised, although doubtless that brilliant modern ovariectomist, Lawson Tait, would class them as "the mortality of a number of experimenters." The comparatively low

death rate of New South Wales and New Zealand may attract your attention. In the first named colony 30 out of 37 cases are by one operator, the esteemed president of this section, who may be fairly regarded as a specialist, and in the magnificent hospital at his command cases should do as well as in private houses. In the case of New Zealand, where the cases are pretty evenly distributed amongst 15 operators, it may fairly be asked whether the colder and more bracing nature of the climate may not favor recovery after severe operations, as well as produce a class of female constitution in which the tendency to shock and collapse would be less.

The following figures are compiled from those *returns which contain either full or partially full particulars of each operation*. After 1862 I have divided them into five-year periods for purposes of comparison with corresponding five-year periods of Sir Spencer Wells' mortality. His average mortality for his first thousand cases was 23·5. This series terminated in 1880. Of course I am aware that his mortality of late years and since he adopted the intra peritoneal method has steadily decreased to less than half that figure.

Australia.		Cases.	Deaths.	Mortality.	Sir Spencer Wells.
1852-1862	...	2	1	50	32
1863-1867	...	7	3	42·8	27·4
1868-1872	...	18	4	22·2	23·8
1873-1877	...	18	8	44·4	23·8
1878-1882	...	32	7	21·8	11·6
1883-1887 (to July)		98	19	19·3	say 10 unknown.
		175	42	24·	

Now, taking what may be called our specialists (seven), or at any rate those who have operated upon from 10 to 30 cases, viz., Tracy, Fetherston, Fitzgerald, Rowan, Foreman, Gardner, and Purchas, we find that they have operated 136 times, with 22 deaths, or, in other words, their mortality is 16·17 per cent. A considerable reduction from 23·7 per cent. And as this death-rate of 16·17 per cent. represents work done by comparatively inexperienced ovariologists beside a specialist like Sir Spencer Wells, the result is, if I may be permitted to express an opinion, a creditable one. Much more so is it when compared with the German statistics compiled up to 1871 by Greuser, showing 129 operations, with 69 deaths, or a mortality of 53·4 per cent., and the French ones up to the same year, showing 32 operations, with six deaths, or a mortality of 18·7 per per cent. Both in Germany and France the mortality in more recent times has greatly diminished. In the former country, up to the end of 1884, Schröder's total mortality was 13 per cent ; Nuss-

baum's, 21.4 per cent.; Olshausen's, 10.3 per cent.; Billroth's, 30.8 per cent. In France, up to 1881, Péan's was 19.9 per cent. In Switzerland, up to 1882, the mortality was 23.3 per cent. In Sweden, up to the end of 1884, 36.7 per cent. However, until those operators in our large centres of population who make a specialty of gynaecology take the trouble to carefully note and collect their statistics of ovariectomy for publication, they cannot complain if their results suffer by inclusion in a general table such as I have put before you.

We now come to some special statistical points of interest in our Australian cases, and it must be remembered that the totals mentioned under these heads represent the total returns giving definite information upon each special point referred to.

Hospital cases, 123; deaths, 36; mortality, 29.2 per cent.

Private cases, 109; deaths, 19; mortality, 17.4 per cent. Includes private hospitals.

Married cases, 112; deaths, 29; mortality, 20.5 per cent.

Single cases, 29; deaths, 11; mortality, 38 per cent. Wells' statistics show the mortality nearly equal among married and unmarried.

Children before operation, 58; deaths, 10; mortality, 17.2 per cent.

No children before operation, 21; deaths, 4; mortality, 19 per cent.

Had children after operation, 13, which represents 9.2 per cent. of married and single operations.

Healthy, 61; deaths, 14; mortality, 23 per cent.

Health impaired, 36; deaths, 8; mortality, 22.2 per cent.

Tapped, 60; deaths, 18; mortality, 30 per cent.

Not tapped, 47; deaths, 9; mortality, 19.1 per cent.

There yet exists some divergence of opinion on the part of eminent authorities as to the effect of tapping upon the mortality after ovariectomy. For whilst Lawson Tait designates tapping as a "surgical crime," Sir Spencer Wells says that on going over the records of his first 500 cases he could not find out that the results of the operation were affected by more than two per cent., and that an investigation of the details of subsequent cases confirms his impression that the mortality of ovariectomy is but little affected by previous tapping; and that there is no proof that it produces adhesions, there being no adhesions in some of the patients who had been most frequently tapped, and firm adhesions in some who had never been tapped. Tapping should be done with antiseptic precautions, to prevent the danger of putrefactive changes in the fluid; also that in compound or multilocular cysts tapping may sometimes be a useful

prelude to ovariectomy, either as a means of gaining time for a patient's general health to recover, of clearing the urine of the albumen with which it is sometimes charged under the mere influence of pressure, or of lessening shock by relieving her of the fluid a few hours or days before removing the solid portion of an ovarian cyst.

Our mortality so far tells against the practice.

ANTISEPTIC CONTRASTED WITH NON-ANTISEPTIC OPERATIONS.

Operation, antiseptic cases, 68; deaths, 11; mortality, 16·1 per cent.

Operation, not antiseptic cases, 38; deaths, 14; mortality, 36·8 per cent.

In this table antiseptic cases include all those in which full antiseptic precautions were taken, though in some the spray was only used to prepare the operating room, and in others it was not used at all. Here, again, we have evidence of a reaction against Listerism in Great Britain during the last few years. Skene Keith (*B. M. J.*, February, 1887) regards "perfect cleanliness," or "the systematic use of the nail-brush," as the most important factor in the principle of Lister. Lawson Tait almost scoffs at it, and says that if he could get germs in sufficiently large quantities, and found them dry, elastic, and absorbent, he would willingly stuff his pads with them instead of wool. For cleansing the peritoneum also he fills the abdomen with blood-warm water and washes all the organs, and repeats this till the water comes off clear—the water being unfiltered tap-water, without the addition of any drug or chemical, and warmed by the addition of enough from the boiler. The water used contained, according to analysis, small beasts of 34 different varieties (*B. M. J.*, May, 1886). Then, again, Dr. Granville Bantock states that for 1884-5-6 the mortality in the Samaritan Hospital *with* antiseptics was 10 per cent., and *without* antiseptics only 4·2 per cent; also that in his own last 100 cases (to January, 1887) his mortality *without* antiseptics was only 4 per cent., and only one in his last 60 cases had died (*B. M. J.*, February, 1887).

All this is doubtless a shock to those who, like myself, were educated to a firm faith in the antiseptic system of Lister. We must not forget, however, that whilst skilled operators like the above, doing their work amidst surroundings which are practically maintained in an antiseptic condition, may afford to dispense with Listerian details, to do so under the conditions surrounding most of the operations performed in Australia would be a risk which no conscientious surgeon would care to run; and this is conclusively proved by our statistics.

LENGTH OF INCISION.

Long incision cases, 39; deaths, 12; mortality, 37·7 per cent.

Short “ “ 53; “ 9; “ 17 “

As Keith justly remarks, the natural explanation of the greater mortality after a long than after a short incision is that a large incision is required when the tumour is badly adherent, or when it cannot be diminished in size by the trocar, or by breaking down with the hand.

ADHESIONS.

Strong adhesions cases, 42; deaths, 19; mortality, 45 per cent.

Slight “ “ 45; “ 3; “ 6·6 “

No “ “ 28; “ 4; “ 14·2 “

By *strong* adhesions I mean those requiring careful dissection or ligature of vessels, without reference to the extent. *Slight* adhesions, which in many of the cases were very extensive, refer to those easily broken down, and causing no hæmorrhage requiring special control.

TREATMENT OF PEDICLE.

Intra peritoneal cases, 82; deaths, 14; mortality, 17 per cent.

Extra “ “ 51; “ 17; “ 37·2 “

The intra peritoneal method, the principle of which was fully established in the early history of ovariectomy by Ephraim McDowell and Nathan Smith from 1809 to 1824; also adopted by Baker Brown in 1865-7, and again re-established by Thos. Keith, is now generally practised, and Lawson Tait ventures to say that no one will ever again have the hardihood to make a deviation from it.

ONE OR BOTH OVARIES REMOVED.

One ovary removed—Cases, 145; deaths, 36; mortality, 24·8 per cent.

Both ovaries removed—Cases, 25; deaths, 3; mortality, 12 per cent.

MORTALITY AT DIFFERENT AGES FOR 158 OPERATIONS.

Years.	Cases.	Deaths.	Mortality.	Proportionate frequency.
14-21	9	4	44·4 per cent.	5·7 per cent.
22-28	37	9	24·3 “	23·4 “
29-35	38	5	13·1 “	24·0 “
36-42	30	10	33·3 “	19·0 “
43-49	8	2	25·0 “	5·0 “
50-56	25	4	16·0 “	15·8 “
57-63	9	2	22·2 “	5·7 “
64-70	2	0	0·0 “	1·26 “

The two youngest cases—Dr. Gardner's, æt 15, parovarian cyst—recovered.

“ “ —Dr. Tracy's, æt 16, multilocular cyst, partially adherent—recovered.

The two oldest cases—Dr. Pinnoek's, æt 67, unilocular cyst, firmly adherent—recovered.

“ “ —Dr. Foreman's, æt 66, not specified—recovered.

Dr. Ogle says:—“Among 3,414 deaths ascribed in ten years (1871-80) either to ovarian dropsy or ovariectomy were two under 15 and seven over 85 years of age. The greatest absolute number occurred between the ages of 45 and 55, and next to this the decennia on either side of this period of life.” Dr. Ogle adds—“It appears that the time of life when this disease is most fatal (*i.e.*, causes most deaths in proportion to the number living) is from 55 to 65, and the next fatal periods the decennia on either side of this” (*Spencer Wells on “Abdominal Tumours”*).

Our table shows the lowest mortality between 29 and 35 years of age, and the next lowest between 50 and 56 years; the highest between 14 and 21 years, and next between 36 and 42 years.

CAUSES OF DEATH.

			Peaslies, 50 cases.	Clay, 150 cases.
Shock, or collapse	... 14		7	25
Peritonitis	... 9		12	64
Septic peritonitis	... 2		0	0
Septicæmia	... 1		9	0
Pyæmia	... 3		0	0
Pelvic abscess	... 1		0	3
Pulmonary embolism	... 2		0	0
Bursting open of wound	... 1		0	0
Exhaustion	... 3		7	0
Over exertion (getting out of bed and walking about the ward on fifth day)	... } 1		0	0
Secondary hæmorrhage	... 2		9	24
Unspecified	... 3		9	19
	—		and other	and other
Total	... 42		causes	causes

NATURE OF TUMOUR IN 141 CASES.

Simple ovarian cysts (uni and multilocular)	...	94
Parovarian cysts	... ..	2
Dermoid	... ..	4

Suppurating cysts	..	...	...	4
Gangrenous “	...	...	...	1
Malignant “	...	...	...	7
Solid “	...	...	...	7
Semi-solid “	...	...	...	13
Colloid “	...	...	...	3
Sarcomatous “	...	...	...	4
Partly ossified cysts	...	...	...	2

MORTALITY OF 153 CASES AT VARIOUS MONTHS OF OPERATION.

Month.	Cases.	Deaths.	Mortality.	
January ...	12	4	33·3 per cent.	2
February ...	6	3	50·0 “	Highest
March ...	18	5	27·7 “	3
April ...	18	3	16·6 “	7
May ...	12	2	16·6 “	7
June ...	12	3	25·0 “	5
July ...	9	1	11·1 “	8
August ...	13	3	23·0 “	6
September ...	15	4	26·6 “	4
October ...	12	3	25·0 “	5
November ...	15	4	26·6 “	4
December ...	11	1	9·0 “	Lowest

By taking our summer months against our winter months we get

November ...	15 cases	4 deaths	
December ...	11 “	1 “	
January ...	12 “	4 “	
February ...	6 “	3 “	
	—	—	
	44 “	11 “	or 25 per cent.
May ...	12 cases	2 deaths	
June ...	12 “	3 “	
July ...	9 “	1 “	
August ...	13 “	3 “	
	—	—	
	46 “	9 “	or 19·5 per cent.

Nearly 6 per cent. in favor of winter operations.

Out of 18 cases in which the *ovarian fluid was examined microscopically* there were

Drysdale's cells	in 13
Cholesterin	“ 4
Columnar epithelial	“ 1

Unnamed epithelial	in	2
Adhered blood	"	4
Oil globules	"	3
Pus	"	1
Lymph corpuscles	"	1

The Sp: Gr: was taken in six cases, resulting thus:—

1001	1005	1014	1016	1030	1038
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Before concluding I think it will be right to draw your attention to a few cases in which unusual conditions existed, and in which recovery took place after the operation.

No. 1.—In which the uterus was so intimately attached to the right cyst that it had to be removed as well as both ovaries. Discharged on 33rd day.—*Dr. Goode.*

No. 2.—Pregnant four months at time of operation, and uterus being accidentally wounded during the operation was removed at the same time. There were also omental adhesions requiring ligature. Discharged in four weeks.—*Dr. Fortescue.*

No. 3.—Pregnant seven months at time of operation, and confined of living child two months after operation.—*Dr. Wright.*

No. 3.—Operated upon five months after birth of a child, and was again confined of twins within 12 months, and subsequently of three other children.—*Dr. Wright.*

No. 5.—In which the abdominal incision gave way during a fit of coughing on the 10th day—24 hours after the stitches had been removed. The omentum protruded. Was not returned and incision resutured for seven hours. Recovered without any incident.—*Dr. de Zouche.*

No. 6.—In consequence of a suspicion of cancer the pedicle though short was brought outside and fixed to walls of abdomen by a stout spit. Next day patient was so low and in such pain that the spit was removed and the pedicle allowed to fall into the abdomen. She left in two months with a discharging sinus from wound. Three years afterwards the ligature came away, and the sinus immediately healed and patient became quite strong.—*Dr. Stenhouse.*

No. 7.—After removal of a dermoid cyst patient was troubled with violent sickness for several hours daily for nearly a year, and a hernia larger than a child's head gradually developed. The abdomen was again opened and the peritoneal toilet again performed as in ovariectomy, and smart hæmorrhage occurred very difficult to control. She made an excellent recovery, and is in splendid health now.—*Dr. Closs.*

No. 8.—Pedicle had twisted, a vessel ruptured, and then peritonitis occurred, during which she was operated on. Both ovaries removed and abdomen washed out with warm water and curved glass drainage tube inserted for two days. Twenty-two days after operation patient miscarried with a recently dead $3\frac{1}{2}$ months fœtus. The placenta being adherent, and hour glass contraction occurring, necessitated the use of methylene for its removal. Eight days after, or 30 days from operation an abscess formed in the right iliac region, on opening from which a large mass of rotten grey clots was evacuated by the finger and a large drainage tube inserted, after which she progressed favorably.—*Dr. Balls Headley.*

No. 9.—Peritonitis at time of operation. Abdominal cavity washed out with warm carbolic lotion. Pedicle clamped and brought outside. Thomas's glass drainage tube inserted, which discharged copiously for fortnight, first clear and afterwards purulent ascitic fluid. On the sixth day a knuckle of intestine protruded into the antiseptic dressings, and became adherent to the peritoneal surface of the abdominal wall on the left side. This had to be separated and the wound resutured. Patient discharged well in two months.—*Dr. Balls Headley.*

No. 10.—After removal of a multilocular tumour, extensively adherent to the omentum, and the pedicle clamped and brought outside, did well for three weeks when she had rigors and fever, and five days after passed half a pint of fetid pus from the rectum, and continued to discharge a small amount daily for two weeks. She then had another severe rigor, with profuse sweating, and became collapsed, and passed four ounces of fetid pus. She was given quinine and opium in pill three times daily and plenty of port wine, and gradually improved, and was discharged well two and a-half months from date of operation.—*Dr. Traey.*

No. 11.—Operated upon at the eighth month of pregnancy, and a multilocular tumour of the right ovary, weighing 13 pounds, removed. During the operation the uterus was accidentally wounded, and the wound was afterwards enlarged to five inches, and a living child and its placenta extracted. The incision in the uterus was secured with ten silver wire sutures, the free ends being tucked into the incision. Pedicle of tumour treated by extra-peritoneal method. There was a purulent discharge from the lower end of the wound for two weeks. Patient menstruated for four days a month after the operation, and was discharged well in six weeks from date thereof.—*Dr. Hillas.*

I have now, gentlemen, given you all the information on this subject that I have been able to extract from material available ;

and take this opportunity of sincerely thanking those who from all parts of the Australian colonies responded so willingly to my application for their personal experience of ovariectomy. Accept, also, gentlemen, my best thanks for your patience and attention.

DR. CHAMBERS (Sydney) expressed his indebtedness to Dr. Pinnock for the paper, and noted specially the small percentage of deaths recorded from New South Wales. He himself had lost five women in his practice, and had performed forty-five abdominal sections for ovarian and uterine tumours. His experience led him to concur with Dr. Pinnock as to the inadvisability of operating in hot weather. He considered tapping in the case of very large cysts good practice, as allowing the patient to gain strength before the radical operation. He had been familiar with the use of carbolic acid for years, having, he believed, performed the first ovariectomy ever done under the spray in London, but had now discontinued its use, and used no antiseptics, except carbolic acid for cleansing the sponges. He thought the spray was depressing, and a possible cause of pneumonia and peritonitis. He now washed out the abdomen with hot water, and found that in collapse, filling the cavity with water of 120 to 130 deg. F. a wonderful means of restoring the patient. He favoured a small incision and the removal of the other ovary in women over forty. He had operated with success on two women over seventy years of age, and had once found the wound burst open from vomiting, without however, a fatal issue.

MR. FOREMAN (Sydney) regretted the meagre and badly kept statistics of the Prince Alfred Hospital, Sydney. He had not found hot weather in itself prejudicial in cases of ovariectomy. He used a glass drainage tube, and sometimes left it in three or four days. He considered that when the cyst was colloid the other ovary should be removed, but would not remove a sound ovary without the patient's consent. He, with other gynaecologists, recognised the value of hot water in collapse, and pointed to Lawson Tait as the exponent of this method.

DR. GARDNER thought Australian ovariectomists might congratulate themselves on the percentage of deaths shown by Dr. Pinnock. He had a great objection to tapping prior to the radical operation as he had seen acute peritonitis so caused in cases on which he had subsequently operated. He found the mortality was increased in the hot summer weather. He always adopted the intra peritoneal method of treating the stump, and had no experience of drainage. He advocated removal of both ovaries in all cases.

DR. GÖRGER was averse to operating in hot weather. He had lost one case out of six, and totally disapproved of tapping.

THE ALEXANDER-ADAMS OPERATION.

[By JOSEPH FOREMAN, L.R.C.P., M.R.C.S., Chairman of Section.]

No doubt we can all sympathise with each other in the unsatisfactory result of our treatment in a great number of cases of backward displacements and prolapse of the uterus. We all meet cases where the uterus has been replaced and a pessary inserted, comfort being given for a time, but shortly after the patient reappears, and presents the instrument, saying it would not keep in position or was painful.

One pessary after another is tried, they are twisted into all imaginable forms, new shapes made, and their variety is endless, but all to no good purpose. Patient and doctor are sorely tried, and the former wends her weary way to one doctor after another, despairing of permanent relief. One I know to have consulted fourteen. I do not in any way decry the use and advantage of pessaries in suitable cases, for I do not think there is a greater believer in them than myself, but the number of cases where they are either useless or productive of harm is sufficient to make us hail with pleasure and gratitude the discovery of an operation so fraught with unspeakable comfort to the patient and with perfect satisfaction to the doctor as Alexander's operation for shortening the round ligaments.

The operation in question, still a comparatively new one, still with its army of detractors, will win its way as one of the greatest improvements in surgery for the benefit of women, just as ovariectomy has done. It is one which has nothing to fear from time and experience.

It is neither necessary nor desirable to go into the troubles produced by displacements of the uterus, which though, as a rule, in no way dangerous to life, cause the unfortunate sufferers almost intolerable misery. In acute flexions, where the ovaries are dragged down very low, the sufferings are of necessity more intense, whilst, if the patient becomes pregnant, there is usually a miscarriage, frequently followed by pelvic effusion, and a fatal issue.

I now propose to consider an operation which will absolutely restore the normal state, provided the uterus can be fairly easily replaced by the sound. I mean that by shortening the ligaments all the troubles arising from the displacement, which in the vast majority of cases is the sole cause, will be rectified, and nothing else can either be promised or expected. Enlarged, tender ovaries are generally pulled into place, and the patient gets the long-wished for relief, but the surgeon would be a rash one who would "promise" to do this. The relations of the parts allow some traction on the

broad ligaments as well as on the uterus, but adhesions would easily prevent the ovary moving. The operation itself, I venture to submit, requires a great deal of practice, and it was not until I had done a considerable number that I felt quite at home. A good light is of the utmost importance, and with this but few difficulties present themselves.

In my first case I failed to find the ligaments; in the second I had the advantage of the counsel of Dr. Worrall, of Sydney, who had seen Dr. Alexander operate. After great difficulty—for we were all practically new to it—I succeeded in completing the operation successfully, and the patient is now perfectly right. After knowing what to do, all that was required was practice. I have now done 67—45 in the Prince Alfred Hospital and 22 in private practice. I have had one death in the hospital from septic peritonitis, but I do not fear such a result in future. In three of these cases I failed to find the ligaments, and in two others I found them on one side only. All these occurred in my early experience, and I do not think the failure is likely to happen again.

It is sometimes stated that the ligaments do not exist. I doubt this very much. I believe every woman with a normal sexual system has them. They are, at least in my experience, found as large well-defined cords. They certainly vary as to size, and in subinvolted or retroflexed uteri I always find them of enormous thickness. I have noticed that the greater the weight of the uterus the larger is the cord. It is sometimes said, and I saw it again stated in one of journals last week, that the round ligaments give no support to the uterus, and do not help to keep it in place. I quite agree that the packing and elasticity of the viscera, together with the pelvic fascia, are the main factors for the support of the uterus, but I cannot understand why the proper function of the round ligaments is overlooked. In the first place, if they were useless they would not be there, or, at any rate, would become atrophied, which is never the case. Large and well-developed structures such as these are surely for some purpose. As I have before remarked, in displacements they become hypertrophied, just as most organs do when their work is increased. But the most conclusive proof of all is that a retroverted uterus can actually be put in place and kept there by their means. I do not think any other argument for their use is required than the last result.

As an example—A patient 45 years of age, single, was sent to me at the hospital by Dr. Sydney Jones for retroversion, with prolapsed painful ovaries. We decided to shorten the ligaments first, and thus to try and pull up the ovaries, hoping by so doing to save an abdominal section.

It was also thought that if the second operation were necessary it would be easier for the surgeon and better for the patient not to have any displacement left to cause discomfort afterwards. The operation was done with the distinct understanding that no benefit was promised, and that the second would almost certainly be necessary; but we thought it greatly to her advantage to do as we proposed. The ligaments were shortened on February 22, 1887, Dr. Sydney Jones assisting. No relief was given by this, and abdominal section performed on July 8, 1887, Dr. Sydney Jones again assisting. The ovaries were small, diseased, and attached by a broad base low down in the pelvis. It was quite out of the question trying to remove them, and the unfortunate woman will, I fear, still have to suffer. Advantage was taken during this operation to ascertain the effect of the previous one. The uterus was in the middle line, in a perfectly normal position, and both ligaments tense and firm, the uterus itself being freely moveable. It is seldom one has the opportunity of seeing the results of an operation in such a manner. It showed that the effect in replacing a retroverted uterus was perfect, but that as the trouble had been due to other causes, many painful symptoms were not relieved.

One of the first considerations in advising patients to undergo any operation whatever is the probable duration of the benefit they may receive. It has already been abundantly proved in Alexander's operation, but if anything will test it better than another it will be pregnancy. I myself know of eighteen of my patients having since this operation become pregnant, and in one case only was the confinement at all difficult. The forceps were used and the cervix lacerated, but the uterus remained in place. The parturients generally seem to have even better times than usual, and I have never heard of any discomfort during pregnancy. I have not attended any of the confinements myself, but I have heard particulars from the doctors who did so, and have generally seen the patients some weeks after and examined them.

The Operation.—In the first place the pubes must be shaved. I at first used to make an incision from two to three inches long in the direction of the inguinal canal, commencing at the spine of the pubes, but I now prefer to make a vertical one over the external ring. It looks better and is covered altogether when the hair grows again, which may not be the case in the old way. I also think it drains better. The external ring should be well defined, and the best guide afterwards will be the genital branch of the genito-erural nerve coming out of the inguinal canal. It is usually easy to find. The ligament will be found a little deeper and external to it. I use

a pair of dissecting forceps to take it up. Gentle traction is made and as a rule it gives fairly easily, but if there is any difficulty I cut a few fibres of the fascia about it. When the ligaments are drawn out an inch or so I replace the uterus with a sound which I give to an assistant to hold. More traction is then made until it is considered sufficient; the ligaments are then secured by stout gut. These I never run through the skin, only through the pillars of the ring, going through the middle of the ligament with each suture, the number on each side being from two to four. The nerve now is only sometimes purposely divided. Lately I have left it alone, as I see no difference in the result whether it is interfered with or not. The wound is then dried thoroughly, the slae placed at the bottom, and a horse hair drain put in, the skin being brought together by horse hair sutures. A dry pad of lint, secured by a broad band of strapping is the only dressing used, no bandage being necessary. The sound is now taken out, and in the majority of cases a glass stem put in; sometimes a Hodge as well, but this is more as a safeguard, and I never see any trouble from the use of either. I may say the skin almost always heals by first intention; very often, however, some suppuration takes place deeper down, but owing to the horse hair drain is never of any consequence. The after troubles are practically nil. The chief desideratum is to keep the patient in bed from three to four weeks. This must be insisted on, for they generally feel so well after the first few days that there seems little to cause them to remain quiet. The old pains vanish, there is a great improvement in the general look of the patient, and her condition becomes in every way satisfactory.

Of the total number of cases (67 in all) five were done for prolapse. The first of these remained well for about four months, when during some heavy work the uterus came down again as badly as ever. This experience has taught me, in cases of prolapse, to repair the peritoneum if required and narrow the vagina. I also use a ring pessary for some months. The other four cases are perfect in their success.

One case was operated on for a retroposed uterus which caused a great deal of trouble from pressure. In this case I found the ligament on one side only. The patient received no benefit whatever. I do not now think the operation suitable in such cases, and it was done in this one as a trial with the patient's full knowledge and consent.

The number of patients who failed to obtain relief of painful symptoms amount to seven. Of these two were partially relieved—*i.e.*, the first patient operated on in private having a heavy uterus

was enabled to wear a pessary, which she could not bear before. The same thing happened to one of the hospital patients. In those others the uterus fell back to its old position and could derive no benefit from pessaries. The cause of the uterus falling back again was due, I consider, to the want of a stem after the operation. In two cases of failure in obtaining relief the cause was due to co-existing ovarian disease.

The great drawback has been the tendency to inguinal hernia in those who have to work hard soon after recovery. In one case it was brought on by sickness during pregnancy. I think I now obviate this tendency by including the deep muscles in the sutures, so far with success. There is no operation I do with greater satisfaction, and certainly none that calls forth so much gratitude from the patients themselves.

I have felt it my duty to place before my professional brethren my experience of this operation, and I think you will agree with me that the results obtained in the series of 67 which I have brought under your notice are fully equal to those following any operation known to surgery. It has been praised by some, condemned by others, but I humbly tender to Dr. Alexander my gratitude for the introduction of an operative proceeding which has been in many cases the means of restoring to health and usefulness women who had suffered intensely for years, in spite of all efforts at relief by other methods; and I do not think I exaggerate when I say that it may fairly be said to have removed from the category of incurable affections cases which without it could be justly placed in no other class.

ON DRAINAGE AND IRRIGATION OF THE ABDOMINAL CAVITY.

[By H. M. O'HARA, L.R.C.S., L.K.Q.C.P., Brighton, Victoria.]

Mr. Chairman and Gentlemen—Ten years ago Mr. Erichsen, in his opening address to the University College Hospital, dwelt with regret upon the limited supply of novelties at his disposal. “The meetings of other learned associations,” he continued, “were enlivened and made interesting by a review of the past year’s work, and the great facts discovered, but with us it is otherwise; I have no great discoveries to announce to you, and no big theories in abeyance to dilate upon, for the simple reason that the science of

surgery is, as far as essentials are concerned, a perfect science." And then he went on to pity the poor people "across the road" (the medical side) as men who had to deal with a purely empirical science, concluding "we are fortunate in that our branch of the art of healing is, with the exception of a few details of dressing, absolutely perfect, just as is the science of mathematics."

These words were uttered as I have said but ten years ago, yet reviewing the period, short as it is, and remembering the marvellous strides that the science of surgery has made in the interval, we can see how unauthorised such a statement was—the developments having been greater than the most sanguine prophet could dare to predict; a position I am sure which Mr. Erichsen would himself be the first to admit.

At that time our crusade was essentially a guerilla warfare, a fighting against hidden foes, and not only hidden but unknown. Our leading generals lay it down as an axiomatic truth, that an enemy once found is half conquered—once seen half overcome. But at this time the king of surgeons, the leader of our army, had neither seen his foes nor had any consciousness of their whereabouts. To him an abscess in the brain, or pus in the abdominal cavity, was synonymous with death. He was actually in these instances, fighting against foes, of whose method of warfare he knew nothing, and as a consequence any great operations involving these regions were "Isandulas," and the result of similar causes. On the field of Isandula an English army was overthrown and annihilated because the general in command knew nothing of the tactics of his foes; and for the same reason abdominal sections at the time to which we are referring were the mere forlorn hopes of the venturesome surgeon. There were two considerations actuating my mind in this direction when I sat down to write this paper. The first, that this, of all others, is to-day at once the most astounding and fascinating aspect of surgery, and the one that holds out to us the greatest prospect of phenomenal results; the second, that it has been my good fortune to meet with unusually well marked instances of its truth, and my still better fortune (so I hold it) to add to the sum of surgical knowledge a detail, and an all important detail, which makes the system possible and, as I think, perfect.

Emerson once said that the light of a theory is never so clearly shown as when it falls upon a fact, and therefore, although I am in so doing treading upon well-beaten paths, I must ask you to allow me to give you the notes of one or two cases which illustrate the truth of the principle to which I have just referred. Before doing so I am anxious to disclaim any credit in the first of these cases, as

it was the unlooked-for outcome of a step which has often to be taken by surgeons in large practice, where for many reasons something has to be done, but where, at the same time, there is little hope of doing any real service.

The first case, the main features of which I am anxious to draw your attention to, is that of Miss F., a girl of 19 years of age, first seen in consultation with Mr. Caffyn, of Brighton. After some difficulty we discovered that the patient was suffering from cancer of the ovary, and the surrounding symptoms were such as to warrant its removal. On the 15th July, 1886, the ordinary abdominal incision was made in the median line, and without much difficulty the left ovary was removed, and found, as anticipated, to be undergoing sarcomatous degeneration. The ovary was the size of a mandarin orange, and from microscopical examination made of it by Mr. Caffyn, presented spindle cells of a well-marked character. The operation was done and the wound dressed with every possible antiseptic precaution, but notwithstanding this, on the third morning after the operation the whole of the dressings and the bedding underneath were saturated with a discharge so fœtid and septic that it really required a good deal of moral courage to enter the room. Our school-gained knowledge of surgery holding out no hope of recovery, something we decided should be done, for the sake of the other patients in the hospital—(I may here state that the patient was in my private hospital)—and to make attendance upon her possible. With these objects in view, before removing the dressing I mixed in the ordinary way a large bucketful of soluble phenyle solution. We then removed the dressings, when every stitch was found to have ulcerated through, and a perfect fountain of purulent matter welled up between the convolutions of bowel presenting themselves at the gaping wound. The appearance of the whole thing was heartrending, hopeless, and perfectly indescribable. However, for reasons before-mentioned, I poured in my solution of soluble phenyle, the edges were brought together with Meade's adhesive plaster, a large drainage tube introduced, and the patient left for the day, her temperature at this time being only 99°.

On the following morning the same condition of things, somewhat modified, was found to exist, and again the same treatment was carried out, her temperature still remaining at 99°. The case went on in this way for a fortnight, each morning finding a diminution in the quantity and putridity of the discharge, until the 20th day, when it ceased to flow, and the wound commenced to granulate. But to give you some idea of the amount of destruction that had taken place it was found impossible to draw the edges of the wound to-

gether, there being left a gaping orifice higher than the umbilicus and three inches across. This was filled by the transverse colon, which became attached to the sides of the opening, granulated over, and is to-day covered with skin, so that the mere pressure of a finger on it will tell you the nature of its contents.

The moral of this case I hold to be simply this—that foes, ever so numerous and ever so virulent, are not to be feared, if only free exit is given for them, and heroic treatment in the shape of antiseptic measures employed.

While studying the treatment of this case, the thought occurred to me that another road might be made whereby the accumulation of purulent matter in the abdominal cavity might be prevented; in other words, that the usual law in surgery, “that the most dependent part be made the opening for the escape of matter,” should apply here also.

I therefore determined that should it be my lot to treat another such case I should get my drainage through the roof of the vagina; in other words, through Douglas’ pouch. I had not very long to wait before an opportunity presented itself.

Mrs. J. W., æt 26, was admitted into my private hospital in November, 1886. She stated that she had not menstruated for three months, that she had had three children without any difficulty as regarded labour, and that her youngest child was now 18 months old.

Being an actress by profession, she was obliged to travel a great deal, and she attributed the intense abdominal pain she was then suffering from to the effects of a tedious railway journey from Sydney to Melbourne.

On examination I found the temperature 105·6, her pulse quick and wiry, her cheeks flushed, her respirations hurried, her tongue dry and brown, and her abdomen tense, painful on pressure, and fluctuating.

I diagnosed this case, as one of pus in the abdominal cavity, probably the result of extra uterine gestation. Viewing the case in this most serious aspect, I called a consultation, and in the presence of Drs. McCansh, Caffyn, and Simons—all due antiseptic precautions being observed—I opened the abdominal cavity. A large quantity of pus and broken down blood clot escaped from the wound, and I then introduced my hand into the cavity and discovered a broken-down ovum of between two and three months’ gestation. Dr. McCansh afterwards very kindly microscopically examined portions of this mass and verified my diagnosis.

Bearing in mind my last abdominal case, and my difficulty in its

drainage, my next step was to pass a knife through the posterior roof of the vagina behind the fundus uteri into the abdominal cavity. In making this incision, &c., in the handle of my scalpel there was a hole, to which I fastened a string, and by this means a drainage tube was pulled into the abdominal cavity and up to the anterior incision. (In making the incision through the roof of the vagina, I place a silver thimble on the forefinger of my left hand, introduce this hand into the abdominal cavity, and pushing up the intestines with the back of my hand and the other fingers, I cut from below upwards on to this thimble; thus there is no danger of pricking the intestine or of wounding one's own finger.)

I now washed out the whole cavity with a saturated solution of boracic acid, brought the edges of the abdominal wound together, dressed it with iodoform and absorbent cotton wool (dry dressing), and had the patient put to bed. The anæsthetic used was chloroform. The patient passed a fairly good night, her temperature at 8 o'clock on the following morning was 100° ; the wound was dressed under the spray, and a warm solution of boracic acid was pumped through the drainage tube from above downwards. The patient expressed herself as feeling comfortable; her bowels were kept at rest by the administration of opium, a catheter was passed every three hours, and iced milk and water was given as her only nourishment.

She went on steadily improving for the next fortnight, the wound being washed out daily through the tube, and as all discharge had now ceased I withdrew my drainage. In 28 days from the date of operation she was able to sit up, and the wound was perfectly healed. She is now following her profession.

I think this method of drainage is an original one, and I should adopt it in any case in which I suspected the likelihood of pus forming in the abdominal cavity after operation. No matter how well placed the drainage tube may be in the anterior wound, there must necessarily be some pus lying for some time in the region of the intestine, before it makes its exit to the surface, and every surgeon knows the danger of a lodgment of even a little pus in this situation.

My next case was the removal of the abdominal tumour which I now place before you. The operation was a formidable one, owing to the immense size of the growth and its adhesion to the parts around, necessitating a large incision (from two inches above the umbilicus to the pubes). The hæmorrhage was very sharp, so I determined to use the abdomino-vaginal system of drainage to which I have referred in the last case. I feel quite sure from the quantity of sanious discharge which escaped through my tube that had I not

adopted this method I should in 24 hours have been forced to open up my abdominal wound, and possibly have lost my patient. As it was she made a speedy recovery, and her temperature never rose above normal. In a paper of this sort I think it is unnecessary to describe the progress of the case day by day. She was up and about in five weeks from the date of operation, but was obliged to wear a pad owing to the flaccid condition of her abdominal walls after such distension and so large an incision.

It is difficult to introduce anything new in these days, when so many inventive minds are at work around us, and even the novelty that it has been my privilege to bring before you to-day has the disadvantage of being to some extent a matter of detail. But when we remember that successful surgery is essentially a matter of carefully arranged detail I think I am justified in thus occupying your time. The result, in my own mind, of a considerable surgical experience has been this: that a man may throw his whole heart and soul into his work, and bring to bear upon it the latest and most advanced surgical knowledge, and be assisted by every possible appliance, and yet fail; and fail merely because he neglects some apparently minor detail of after treatment. Nothing can be more galling to an operator than after doing his work successfully to find that just because he fails to leave an outlet for the discharge he loses his ease, and therefore, I do not think that I can lay too great stress upon the advantages of my abdomino-vaginal system of drainage.

Dr. GARDNER said the question brought forward by Mr. O'Hara was one of the greatest interest. Antiseptic surgeons must adopt the glass drainage tube in the abdominal wound. Those who had given up special antiseptic treatment must adopt vagino-abdominal drainage.

Dr. ELSER deprecated the practice of decrying Listerism while still using Lister's methods.

The CHAIRMAN thought we had lived past the day of eumbrous sprays and germicides, and spoke of the dangers of carbolic poisoning. He was a thorough believer in complete drainage, and appreciated highly the value of Thomas' glass tubes.

ALEXANDER'S OPERATION OF SHORTENING THE ROUND LIGAMENTS FOR INVETERATE DISPLACEMENTS OF THE UTERUS.

[By WM. GARDNER, M.D., C.M., Surgeon Adelaide Hospital,
Lecturer on Surgery the University of Adelaide.]

HISTORY OF THE OPERATION.

This operation was first proposed by Alquié, of Montpellier, in 1840, and was practised at rare intervals with varying success by several surgeons. It seems then to have fallen into disuse, chiefly owing to the difficulty experienced in finding the ligaments, and was revived about the same time by Dr. Alexander, of Liverpool, and Dr. Adams, of Glasgow. Considerable discussion has arisen regarding the claims of priority, and Dr. Murdoch Cameron, of Glasgow, in order to show how many names have been associated with its introduction, quotes an unnamed Continental writer, who, to settle the point, suggests that it should be called the "Alquié-Aran-Deneffe-Soupart-Bourggroeeve-Rivington-Freund-Schultze-Alexander-Adams operation." I think, however, that the credit of the operation, although only a revival of an old one, should be given to Dr. Alexander, of Liverpool, who has operated 123 times with three deaths, because he first laid down systematically the lines by which success could be ensured, and demonstrated the kinds of displacement in which it was likely to be of service. My first operation was performed on February 14th, 1883, and since then I have operated thirty times. The plan which I shall adopt in this short *resumé* is to give a list of all my operations, with the condition for which operation was deemed necessary, and the immediate result. Afterwards the mode of operating and the after-treatment will be discussed, and finally I shall endeavour to lay before you as faithfully as is possible the remote results so far as I know them, and lastly, I shall endeavour to indicate the cases for which the operation is suited, and to discuss the result as compared with treatment by pessaries.

1. MRS. P.; age, 30. Hospital.

Date of Operation.—February 14th, 1883.

Cause.—Prolapse three inches outside of vulva; cervix tripartite.

Duration of Symptoms.—Ten years.

Result.—*In statu quo.*

Remarks.—Traehelorrhaphy was first performed, and then at a subsequent operation the ligaments were drawn up one inch. This amount of pulling up was quite inadequate; but I was then ignorant of the amount necessary, and so the case was unrelieved. As I could not again pull up the ligaments, I restored the perinæum and partially closed the vagina.

2. MRS. U.; age, 44. Hospital.

Date of Operation.—February 28th, 1883.

Cause.—Prolapse.

Duration of Symptoms.—Twenty-four years.

Result.—Successful.

Remarks.—In this case I was unable to find the left ligament, and so I was obliged to pull up the uterus by the right alone—the os uteri lying obliquely across the pelvis. Up to the present time this case has remained completely successful. Her work compels her to pass a large part of her time in the upright position, being that of a monthly nurse.

3. MRS. A.; age, 30. Hospital.

Date of Operation.—September 26th, 1883.

Cause.—Retroflexion, with rupture of perinæum.

Duration of Symptoms.—Unknown.

Result.—Successful.

Remarks.—This was the first case in which I ventured to pull the ligaments out so far as to enable me to tie them together over the mons veneris. A month later I restored the perinæum. In May, 1885, she was delivered of a living child, upon whom I afterwards operated successfully for strangulated hernia. On June 26, 1885 (six weeks after delivery), I passed the sound, and found the uterus normal in position and depth. At the end of July, 1887, she consulted me again, and I found that she was then pregnant three months. She complained of no pain, and was able to take a great amount of exercise (even to the extent of playing tennis whilst pregnant) without pain.

4. MRS. H.; age, 35. Private.

Date of Operation.—March 19th, 1883.

Cause.—Retroflexion and prolapse, absence of the perinæal body, and laceration of recto-vaginal septum for one and a half inches.

Duration of Symptoms.—Unknown.

Result.—Successful.

Remarks.—On 19th March, 1883, trachelorrhaphy was performed, and the round ligaments pulled up till the fundus could be felt through the abdominal parietes. On 21st March I restored the perinæum, and closed the rent in the recto-vaginal septum. This patient was a perfect invalid before operation—could walk no distance without severe pain, and had incontinence of fæces. She can now walk any reasonable distance, and has complete control over the sphincter ani; has been pregnant three times since. The first two times she miscarried, and the third time she was delivered by Dr. Jay of twins, one of whom is, I believe, living at the present time.

5. MRS. P.; age, 30. Private.

Date of Operation.—March 30th, 1883.

Cause.—Retroflexion and prolapse, with laceration of perinæum and recto-vaginal septum.

Result.—Successful.

Remarks.—At the first operation I removed a solid tumour from the left labium the size of a pigeon's egg; at a second operation I pulled up the slack of the round ligaments (three inches), and later on I restored the perinæum. The last time I examined this case was March 18, 1884, when the sound passed forward for the normal distance.

6. MRS. S.; age, 29. Private.

Date of Operation.—October 26th, 1883.

Cause.—Retroflexion, with prolapse of both ovaries.

Result.—Relieved.

Remarks.—In this case, on account of the prolapse of both ovaries and the exquisite tenderness caused by the slightest pressure of a pessary, I pulled up the round ligaments, and she obtained perfect relief from all her troublesome symptoms, and on the 3rd June, 1884, the uterus was perfectly normal. She afterwards had an attack of pelvic cellulitis in Melbourne, probably due to gonorrhœal infection.

7. MRS. M.; age, 33. Private.

Date of Operation.—January 17th, 1884.

Cause.—Retroflexion, with prolapse of one ovary.

Result.—Successful.

Remarks.—In this case the uterus was retroflexed and very tender to touch, with a prolapsed ovary lying under the fundus, and pressed upon by the upper limb of a Hodges' pessary, which had been inserted in an up-country town in New South Wales. The history of this patient's married life suggested syphilis, and on examining the chest I found a distinct node on the clavicle. For this disease she was treated several months, and the uterus was normal when she left Adelaide. In the middle of 1886 I had a letter from her husband in New South Wales, to say that ever since she has been enjoying perfect health.

8. MRS. P.; age, 28. Private.

Date of Operation.—April 29th, 1884.

Cause.—Retroflexion and prolapse of ovary.

Result.—Successful.

Remarks.—On 29th April, 1884, I pulled up the round ligaments, with complete relief of all the symptoms. I examined this patient on the 3rd August, 1887, and found the uterus normal in size and direction.

9. MRS. DEV.; age, —. Private.

Date of Operation.—July 15th, 1884.

Cause.—Uterus retroflexed, with mal-position of both ovaries, with well-marked signs of cellulitis.

Duration of Symptoms.—Six years.

Result.—Successful.

Remarks.—At first treatment by the vaginal douche was continued for several months, till all signs of the cellulitis had disappeared. Then, as no pessary could be borne, I operated on the 15th January, 1884, and pulled up the round ligaments, until the fundus could be distinctly felt by bimanual palpation through the abdominal walls. A year afterwards I examined and found the uterus in normal position.

10. MRS. G.; age, 27. Private.

Date of Operation.—October 14th, 1884.

Cause.—Retroflexion, with prolapse of both ovaries.

Duration of Symptoms.—Two years.

Result.—Relieved.

Remarks.—In this the symptoms were relieved. I saw her a year after the operation, and she had continued perfectly well, although the position of the uterus was one of retroversion, due to a prolonged attack of hysteria on the fifth day after operation. The patient for some hours had frequent opisthotonic spasms.

11. MRS. O.; age, 28. Private.

Date of Operation.—January 6th, 1885.

Cause.—Retroflexion, with prolapse of both ovaries.

Duration of Symptoms.—Two years.

Result.—Successful.

Remarks.—Routine treatment having failed, I pulled up the round ligaments sufficiently to enable them to be tied together over the mons

veneris, and the fundus could be felt through the abdominal walls. On July 25th, 1886, I delivered her without difficulty of a male infant, and both mother and child did well. In July, 1887, I examined her and found the uterus in normal position.

12. Mrs. O. ; age, 30. Private.

Date of Operation.—May 12th, 1885.

Cause.—Retroflexion.

Duration of Symptoms.—Several years.

Result.—Successful.

Remarks.—The usual operation was done in this case, and has resulted in complete relief of the symptoms.

13. Mrs. H. ; age, 35. Private.

Date of Operation.—May 28th, 1885.

Cause.—Retroflexion.

Duration of Symptoms.—Nine years.

Result.—Successful.

Remarks.—This patient had been industriously treated with pessaries for several years without any relief to symptoms. She was operated on in the usual manner, but owing probably to a too free dissection to find the ligament on the right side there has been a slight weakening of the abdominal wall at the external ring, with bulging, and for this I recommended her to wear a Moc-Main truss. I am pleased to state that I saw her lately, and she has discarded the truss for some time, and now has no bulging whatever.

14. Mrs. H. ; age, —. Hospital.

Date of Operation.—October 12th, 1885.

Cause.—Retroflexion, with prolapsed ovary.

Result.—Successful.

Remarks.—In shortening the ligaments in this case they were drawn out on each side from five to six inches, and when I saw the patient in April, 1886, she was completely relieved of her previous symptoms, but the ovary was still prolapsed, and so much enlarged that it will have eventually to be removed. She was compelled, however, to leave the colony, and I have not since heard of her.

15. Mrs. R. ; age, 29. Hospital.

Date of Operation.—March 9th, 1886.

Cause.—Retroflexion, with prolapsed ovary.

Result.—Successful.

Remarks.—This patient was operated upon in the usual way, and three weeks afterwards was quite well; but after the menstrual period, which came on at that time, she developed a perimetritic inflammation, which took several weeks to clear up. The uterus was normal in position afterwards, and I have not since seen her.

16. Mrs. C. ; age, 25. Private.

Date of Operation.—May 20th, 1886.

Cause.—Retroflexion, with prolapsed ovary.

Duration of Symptoms.—Several years.

Result.—Successful.

Remarks.—Had been treated with pessaries industriously for years. Ligaments shortened five inches till fundus could be felt through the abdominal wall; the ends were tightly tied together. The patient was allowed to get up at the end of three weeks, and after the fourth week walked about as usual. No artificial support was used. She reported soon after perfect freedom from pain, and feeling better than she had done for years. In June, 1887, she was delivered in Melbourne of a

living child, and at my request was afterwards examined by Dr. Strahan, of Richmond, who reported a normal position. Since her return to Adelaide, *i.e.*, in July, 1887, I found uterus normal in size and direction.

17. MRS. H. ; age, 47. Hospital.

Date of Operation.—May 21st, 1886.

Cause.—Prolapse; the cervix almost protruding at the vulva in the recumbent position.

Result.—Successful.

Remarks.—Ligaments pulled up till the uterus could be distinctly felt through the abdominal wall. The patient was allowed to get up at the end of the fourth week. When she left the Hospital it was with difficulty that the os uteri could be felt by the examining finger. No report has since been obtained.

18. MRS. S. ; age, 26. Private.

Date of Operation.—June 17th, 1886.

Cause.—Retroflexion, with prolapse of one ovary.

Duration of Symptoms.—Under my care since December, 1884.

Result.—Successful.

Remarks.—After treating her with pessaries for about twelve months, I recommended the operation, and on examining her in June, 1887, I found the uterus absolutely normal in size and position. Within the last few days she has advised me that she is able to dance, ride, and play tennis with perfect comfort.

19. MRS. S. ; age, 28. Private.

Date of Operation.—September 9th, 1884.

Cause.—Retroflexion, with prolapsed and enlarged ovary.

Duration of Symptoms.—About four and a half years.

Result.—Successful.

Remarks.—When first called to this patient I found her unable to go out except in an invalid's chair. She had been treated with pessaries for years by five or six medical men. I removed the right ovary through an incision of barely three inches, then closed the abdomen, and immediately pulled up the round ligaments till the fundus could be felt through the abdominal walls, and tied the ends together over a gauze pad. She left the Private Hospital at the end of four weeks, and was able to walk into town (a distance of four miles) within a few weeks. On June 14, 1886, I delivered her with forceps of a living male infant, without any special difficulty. Examination a few weeks after showed the uterus slightly anteverted.

20. MRS. H. ; age, 32. Private.

Date of Operation.—July 17th, 1886.

Cause.—Retroflexion and prolapsed ovary; fibroid on anterior wall.

Duration of Symptoms.—Four years.

Result.—Relieved.

Remarks.—This case had been treated by every conceivable method of treatment, both in London and Melbourne without any lasting benefit. I recommended removal of the ovaries, but as that was not favored I was asked if nothing else could be done. I said it was quite feasible to pull up the ligaments first, and if that failed, as it probably would from the great weight of the uterus, the other could then be considered. The uterus was pulled up into position by the round ligaments, which were very hypertrophied, and the first period was absolutely painless. At the end of three weeks she was obliged to return to Melbourne, and I had to allow her to go, though much

against my will. The uterus when next I examined her had become retroflexed, but not nearly so low as before, and the fibroid enlargement had increased. Ultimately removal of the uterine appendages will be necessary in my opinion. She has returned to England for a trip, and when there will take the opportunity of consulting eminent specialists.

21. MRS. S. ; age, 28. Hospital.
Date of Operation.—July 26th, 1886.
Cause.—Retroflexion, with prolapse of both ovaries.
Result.—Successful.
22. MRS. P. ; age, 27. Private.
Date of Operation.—July 27th, 1886
Cause.—Retroflexion, with prolapse of one ovary.
Result.—Successful.
Remarks.—I examined her lately, and found uterus normal in position and size. ,
23. MRS. M. ; age, 41. Private.
Date of Operation.—September 4th, 1886.
Cause.—Anteflexion.
Result.—Successful.
Remarks.—This operation was done to relieve bladder symptoms and was perfectly successful in relieving them. A weakness has been left at the left inguinal ring, for which a truss is now worn.
24. MRS. W. ; age, 42. Hospital.
Date of Operation.—December 28th, 1886.
Cause.—Retroflexion and prolapse of right ovary.
Result.—Successful.
Remarks.—No report since.
25. MRS. H. ; age, 29. Private.
Date of Operation.—January 15th, 1887.
Cause.—Retroflexion.
Duration of Symptoms.—Several years.
Result.—Successful.
Remarks.—Had aborted twice on account of the retroflexion, which did not right itself, and I examined her three months after the operation when everything was normal.
26. MRS. F. ; age, 25. Private.
Date of Operation.—March 15th 1887.
Cause.—Anteflexion.
Result.—Successful.
Remarks.—Complained of bladder symptoms which were relieved by straightening the uterus. So far no pregnancy has occurred.
27. MRS. D. ; age, 38. Hospital.
Date of Operation.—March 17th, 1887.
Cause.—Retroflexion.
Result.—Successful.
Remarks.—I examined her last at the end of July, and the uterus was normal.
28. MRS. W. ; age, 35. Private.
Date of Operation.—March 24th, 1887.
Cause.—Retroflexion.
Result.—Successful.
Remarks.—I heard from this patient the other day, and she reported herself as perfectly well.

29. Mrs. McA. ; age, 47. Private.
Date of Operation.—July 7th, 1887.
Cause.—Prolapse.
Duration of Symptoms.—Four years.
Result.—Successful.
Remarks.—Too early to report upon. The left ligament could not be found, and on account of the risk of hernia I did not cut the external abdominal ring and follow it up.
30. Mrs. K. ; age, —. Private.
Date of Operation.—August 14th, 1886.
Cause.—Retroflexion.
Result.—Failure.
Remarks.—In this case although the uterus could be returned easily with the sound, the ligaments when found would not run, owing to some previously existing peritonitis, which had caused adhesion of the ligaments to their investing sheath.
31. Mrs. Q. ; age, 30. Hospital.
Date of Operation.—August 1st, 1887.
Cause.—Prolapse.
Result.—Successful.
Remarks.—This case was dressed on the 8th August, and was all healed up except where the drainage tubes were inserted. The ligaments came out very easily at least six inches.

DESCRIPTION OF THE OPERATION.

After shaving the mons veneris and groins, I push the finger into the external abdominal ring and mark the invaginated skin with the nail of my forefinger on each side. This nail-mark is made the centre of my first incision, which may be prolonged either upwards or downwards should difficulties occur. The first incision is made two inches long in the direction of Poupart's ligament and parallel to it, dividing at one stroke of the knife skin, superficial fascia, and fat. Generally one or two small vessels require torsion or the application of pressure-forceps for a short time. The ring is then thoroughly defined, and after finding the fibres of the round ligament they are followed up until they become a round strong cord, and on this pressure-forceps are fixed. The operation is then repeated on the opposite side till the same stage is reached. An assistant now passes his finger into the vagina in retroflexion cases, and presses the os uteri backwards, whilst the operator gently but firmly pulls up both ligaments until the fundus can be felt distinctly in its normal position through the abdominal parietes. As each ligament is drawn out a fresh hold is taken with pressure-forceps at each two inches to lessen the risk of the fibres giving way. In most cases the ligaments are pulled out from four to six inches, and their ends are then tied together with a thick pad of carbolised gauze under them to keep them on the stretch. Sutures of wallaby tendon are then passed through the skin and ligament, and also round the latter, and the edges of the incision, brought

closely together. A small drainage tube is passed under the ligament and brought out at the lowest point of the incision. Listerian dressing is applied in the usual way either with or without the use of the spray, and scrupulous attention is paid to the disinfection of the instruments and the hands of both operator and assistants.

AFTER-TREATMENT.

In the first 24 hours nothing is given to the patient except ice to suck. No sedative is given, unless the pain is considerable, which it very rarely is, and then only a hypodermic of one-sixth of a grain of morphia. The urine, if not passed spontaneously, is drawn off every six hours with the catheter. No artificial support was used in any of my cases after the seventh. The patient is allowed to rise at the end of three weeks, and rests for another week on the sofa, after which she may commence gradually to walk.

After the first week the patient is turned by the nurse and an assistant on to the right or left side to prevent the irksomeness of the dorsal position, and also because it seems to me that the freshly adhering ligaments are thus relieved from strain. Very slight sickness follows the operation for a few hours, probably due to the ether, and so far no case of peritonitis has occurred. The first dressing generally takes place on the eighth day, when the drainage tubes are removed. After that the wound may be dressed with red lotion, or any other stimulating lotion.

I have kept all the temperature charts, and in no case can I find that the temperature has risen above 100.6° , and in the majority of cases it does not rise to 100° .

The special points with regard to the operation upon which I would insist are:—(1) That there be no lateral division of the fibres of the external abdominal ring. (2) That the sound be not used to restore the uterus to its position, because it is unnecessary and introduces another factor into the question. (3) That the ligaments be tied together and stretched over a gauze pad placed on the mons veneris, as this method offers the most complete obstacle to slipping during the period of from seven to nine days which is the average time required for the ligaments to detach themselves. (4) That no attempt be made to feed the patient for the first 24 hours.

RESULTS OF OPERATION.

Two cases were unrelieved—one due to imperfect pulling up of the ligaments (my first case) and the second due to adhesion of the round ligaments to their peritoneal investments, which prevented them from running when pulled upon.

Of the three relieved—one remained in a perfectly normal

position for eight months, and after that an attack of pelvic cellulitis led to a reproduction of the original condition. The second case was affected by a prolonged attack of hysteria with opisthotonic spasms on the fifth day; but although the uterus became again retroflexed the original symptoms did not return, and this was probably due to a more favorable position of the ovaries in relation to the uterus. In the third case the retroflexion returned, but the symptoms were less severe, and this was due partly to fibroid (interstitial) enlargement of the uterus, and partly to too early removal of the patient after operation.

Twenty-six cases out of the 31 were absolutely successful after operation, and have remained so up to the date of the last examination.

Out of the 62 incisions to find the ligaments only two failed, and both were in the left side. One was my first case, which is returned as a failure, and the other occurred in one of the later cases, due probably to the excessive obesity of the patient and to my disinclination to open up the inguinal canal on account of the risk of producing hernia of the intestine.

No. 3 was operated upon September 26th, 1883, and delivered in May, 1885, of a living child, which was operated on six weeks after successfully for strangulated hernia. She is now pregnant a second time.

No. 4 has been pregnant three times and miscarried twice, the last time being delivered of twins at full time, both living.

No. 11 was operated upon on January 16th, 1885, and delivered of a living child on July 25th, 1886.

No. 16 was operated upon May 20th, 1886, and was delivered in Melbourne in June, 1887, of a living child.

No. 19 was operated upon on 9th September, 1884, and on June 14th, 1886, she was delivered by me with forceps of a living child.

The following intervals have elapsed between the operation and the date of last examination:—

No. 2,	a period of	two and a half years.
No. 3,	"	nearly four years.
No. 4,	"	four years.
No. 5,	"	one year.
No. 6,	"	nine months.
No. 7,	"	three and one-third years.
No. 8,	"	one year.
No. 11,	"	two and a half years.
No. 13,	"	two years.
No. 14,	"	six months.

No. 16,	a period of fourteen months.
No. 18,	“ twelve months.
No. 19,	“ twenty-two months.
No. 22,	“ one year.
No. 27,	“ four months.

There is therefore no ground for thinking that the operation will cause any obstruction to the upward enlargement of the uterus during pregnancy, as all the cases went to full time except one who miscarried twice and wound up by giving birth to twins at full time. Slight dragging pains have been complained of on one or other side during the development of the uterus caused by pregnancy.

Several of the cases which have not been examined lately by me on account of living in remote parts of the colony have advised me by letter of continued good health. No death has occurred.

CASES SUITABLE FOR OPERATION.

I. The best cases are those of retroflexion, with prolapse of one or both ovaries, with well-marked symptoms.

II. The operation may be performed in cases of retroflexion without symptoms, or with trivial symptoms on account of secondary sterility.

III. In cases of ante flexion with primary sterility it may be performed to straighten the uterine canal.

IV. In cases of prolapse it may be performed as a preliminary to colpoperinæorrhaphy, or after failure of the latter.

The operation should not be performed in unmarried women either for retroflexion or ante flexion, unless the symptoms are very marked and accompanied by some considerable enlargement of the uterus.

For purposes of comparison I propose to use the statistics furnished by Dr. Ernst Fränkel in an address before the Berlin Scientific and Medical Association during the present year. In this paper he refers to cases of Alexander's operation which have been published from time to time by Alexander, Imlach, and myself, and distinctly states his objections to the operation. They are as follows:—

1. In corpulent or elderly women, with atrophy of the muscles, the terminal fibres of the round uterine ligaments lie so dispersed, or are so covered with fat or shrivelled, that they cannot be isolated or collected.

2. It is not unattended with danger, and therefore the operation is not admissible.

3. That it has been necessary, after the operation, to continue wearing the pessary, the avoidance of which was the *raison d' être* of the operation.

4. That the shortening of the round ligaments does not touch the chief etiological factor in the most frequent forms of retroflexion, viz., the relaxation of Douglas' folds.

5. Lastly, that an ovary which has descended on account of a retrodeviation of the uterus, but is not adherent, is reduced when the uterus is reduced, shrinks usually very quickly, and loses its sensitiveness to pressure, especially if a strong pessary, such as Thomas's, be used. If the painful ovary has become adherent in an anomalous position, Alexander's operation is of no use whatever. Next, speaking of the treatment of adherent ovary, he recommends ovariectomy, and then stitching the broad ligament into the lowest corner of the abdominal wound; or to adopt Olshausen's latest proposal, and stitch the cornua uteri to the abdominal integument.

I shall arrange my answers to each of the objections in the same order:—

No. 1 is answered by my experience, which shows that out of 62 operations the ligament was only twice unable to be found; and secondly, that no one would think of applying the operation to elderly women, as the atrophic changes which set in after the climacteric would do away with any necessity for the operation.

No. 2 is answered by the fact that I have operated 31 times without a death, and without ever having seen anyone else perform the operation.

No. 3 is answered by my cases, which show that no pessary was at any time applied in the last 24 cases.

No. 4 is answered by the fact that so long a period as four years has elapsed in two of the cases without any return of the displacement, and if a Thomas's pessary is stated to be successful without shortening of the round ligaments, how much more likely to be successful in addition to the operation!

No. 5. In answer to this I would say that Alexander's operation does restore prolapsed ovaries, as does the pessary treatment, if successful, and as no one ever supposed that either treatment would remove a prolapsed and adherent ovary, neither can be disparaged on that account.

Finally, I would say that if a prolapsed and adherent ovary gave rise to symptoms Tait's operation would be successful without any attempt to correct the retroflexion as the onset of the ordinary climacteric changes would then be determined at once.

Should any one, however, think it necessary to restore the uterus to its normal position after removal of the uterine appendages, I would most confidently assert that Alexander's is a far better means of doing so than either Köberle's and Schroder's or Olshausen's.

In the *New York Medical Journal* of November 27th, 1886, Dr. Howard A. Kelly, of Philadelphia, performed and reported an absolutely similar operation to Olshausen's under the name of Hystero-rraphy, but as he removed the uterine appendages first I cannot consider that the further operation was necessary.

Fränkel's cases amount to 294, with 25 cases of successful treatment with pessaries; but as two of the cases were recent and post-puerperal I eliminate them as no one doubts their curability, and the cures are therefore reduced to 23, or only a little over 7 per cent., which contrasts very badly with my results.

Whilst differing from Dr. Fränkel so widely, I cannot too strongly compliment him on the scientific manner in which he laid before the Berlin Association his results.

In conclusion, let me say—

1. That the treatment by pessaries is undoubtedly successful in many of the recent post-puerperal cases.

2. That Alexander's operation, attended as it undoubtedly ought to be with almost no mortality, offers the best chance in the cases which are chronic, and unrelieved by pessaries. Even if we grant that no provision is made by this operation to overcome the relaxation of Douglas' folds, then I venture to submit that this can be overcome by pessaries much more successfully after Alexander's operation than before it.

3. If an ovary is prolapsed and adherent, then Tait's radical operation of removal of the uterine appendages is all that is necessary, and it should be a *dernier ressort*.

In this paper I hope that I have not been too dogmatic, or, if so, I hope that my professional brethren will feel confident that I have been actuated by no other motive than a desire to attain to scientific truth. Those of you who have not practised the operation will, I trust, do so, and, if possible, I would recommend you to endeavour to see others do it first, as you will thereby be enabled to avoid the mistakes into which all pioneers must inevitably fall.

SECTION OF STATE MEDICINE.

Chairman—H. T. WHITTELL, M.D.
President of Central Board of Health, South Australia.

CHAIRMAN'S ADDRESS.

READ IN GENERAL MEETING OF CONGRESS.

When I received the invitation of the Executive Committee to preside over one of the Sections of this Congress I was not aware that my compliance would involve me in the more difficult task of delivering an address on State Medicine to the whole body of members. I had understood that the posts of honour were to be filled by gentlemen who might favour us with their attendance from other colonies, and I anticipated as much pleasure from the address on State Medicine as we have all experienced in listening to the addresses that have been delivered on Medicine, Surgery, and Gynæcology. I learn, however, that we have been disappointed in our hopes of securing the attendance of some gentlemen who were expected to be with us, and when final arrangements had to be made it was necessary to tell off a local man to occupy a position which, if our intentions could have been realised, would have been better filled by the President or Medical Officer of the Board of Health from one of our neighbouring colonies.

The subject to which I have to invite your attention is State Medicine, an indefinite phrase, meaningless in itself, but which from usage is understood to express the action and duty of the State in relation to the physical welfare of its subjects. It has wide ramifications, but in the limited time at disposal I purpose to confine my address to a notice of some questions upon which there may be differences of opinion in relation to the duty of the State in providing for the removal and prevention of disease. These may be conveniently discussed under three headings:—

1. The action of the State in relation to existing disease.
2. The action of the State in the prevention of disease.
3. The machinery through which the State can most effectively exercise its authority for the preservation of the public health.

Under the first of these divisions there is much that would tempt one to linger. The provision and management of general hospitals, the necessity for local hospitals for infectious disease, the medical

relief of the sick poor, the control of hospitals for the insane, are subjects upon which hours of our time might profitably be spent: but as probably there would in the end be little divergence of opinion, I will confine my remarks under this head to a subject noticed in our President's address and discussed at some length in our section. I refer to the relation of the State to the medical profession. Is it desirable that the State should prevent the practice of medicine by gentlemen who without any known qualification profess to be able to undertake the cure of disease? During the last week I have been reading the voluminous evidence taken by the Commission appointed by the New South Wales Government to inquire into the law respecting the practice of medicine and surgery in that colony. The revelations and the confessions are astounding. Those who have the best means of knowing have assured me that evils of the same character as those brought out in the Sydney report are rampant in South Australia, and in the face of such disclosures we may well ask what shall be done? I am one of those who believe in the rights of all men to undertake any work for which they are capable. I do not believe in shutting the door against anyone who has the knowledge or skill required for any necessary work, and as an old practitioner I say that an educated profession has nothing to fear in the long run from the opposition of the unqualified. I am therefore opposed to any attempt to obtain protection for the profession by prohibitory enactments. There are, however, other interests to be considered, and I look on it as a scandal in any community that men be permitted to undertake duties that involve human lives without giving some evidence of their qualifications. This concerns the State rather than the profession. I do not recommend that a gentleman seeking to practice shall have gone through the mill precisely in the same manner that we believe to be the best mode of preparation—that he must be a graduate of some university or a member of some college. I am not disposed to ask him where, when, or how he obtained his knowledge. The business of the State is to know that he has the knowledge, and this should satisfy every requirement. To ascertain this I incline to the German method of State examination by independent examiners appointed by the Government, who should require from every candidate proof of a sufficient knowledge of the anatomy of the human body, of its functions, and of its diseases to qualify him to undertake the responsible duties of a medical practitioner. To demand more than this is in my judgment a wrong to the individual, to demand less is a wrong to the community at large.

Passing on to a consideration of the action of the State in the pre-

vention of disease, time will permit me to refer only to that group which is classified under the head of specific febrile diseases, a group in which the classes differ widely in their development, but which are all set down in the College nomenclature as being dependent on morbid poisons. It is not easy to determine the nature of these poisons. During the past centuries this has eluded the patient researches of the great masters who have preceded us, but in our own day, thanks to the discoveries of Pasteur in France, of Koch in Germany, of Klein in England, and of others in different parts of the world, we are beginning to see the light, and pathologists are now, almost without exception, agreed that these poisons are particulate living bodies capable of growth and reproduction wherever they find material and conditions fitting for their propagation. Although these bodies are so minute that some of them appear but as specks under the highest powers of our best microscopes, we are able in many cases to distinguish them either in their morphological appearances or in their mode of growth, and their action when subjected to experimental examination. It is to discoveries in relation to these bodies that the sanitarian must look for knowledge that shall enable him to deal more effectively with diseases of an infectious character. We already know that these poisons can not only be transmitted by direct contagion, but that they can exist out of the body for an indeterminate time; that they can be bottled up in our laboratories for future use; that they can be preserved in the air and the soil or in water, and may be transmitted by these agents to persons far removed from the sources of contamination, and that although probably each poison has its own special conditions of growth, it is certain that some of the more destructive forms find in the accumulations of filth in and around human habitations a special medium for their development and dissemination. You will readily see the bearings of this knowledge on the subject now under consideration, and it will probably occur to you that in a new country like Australia we have to consider its practical application—First, to diseases the germs of which have not yet found an entrance and become acclimated amongst us; and, second, to diseases that are already existing in our midst. From the first class let us select Asiatic cholera and smallpox, and from the second we will take typhoid fever, as illustrations. From the standpoint of preventive medicine these require to be dealt with in Australia by distinct modes of defence. Smallpox—perhaps the most contagious disease that is known—has never gained a permanent footing in Australia. Asiatic cholera, though probably not directly contagious, is readily propagated by the living poison contained in dejecta from patients affected with it. Common-

sense teaches us that in dealing with diseases which have no existence in our country we should endeavour to prevent their introduction, and quarantine presents itself as the most promising means of defence. You will be aware that in the mother country quarantine, even as we practice it, is looked on as a relic of barbarism, cruel, troublesome, and inefficient. During the late scare when cholera was devastating Italy, Spain, and some districts in France, where the most rigid forms of quarantine were adopted, and where even packages of disinfectants were subjected to disinfection before they were allowed to be used, England boldly refused to do anything more than to take the sick from ships into proper quarters and adopt a few hygienic precautions of the simplest character, and when remonstrated with by her neighbours she replied that she based her protection on the condition of her ports, where for years she had been employed in improving the water supply, the drainage, and other sanitary arrangements, and that she was prepared to meet the danger, confident that cholera will not now find in England a soil favourable to its propagation. So far the results have justified the action of the Government, and England has remained free from attack. In our country we have had no experience of cholera. Once or twice in Queensland it has approached dangerously near, but strict quarantine confined it to the passengers or crews of the ships in which it was conveyed. We are far behind England in all that relates to sanitation, and I am doubtful whether it would be safe to trust to English precautions. I believe that for the present it is better to give the enemy a wide berth, and at the expense of temporary inconvenience to our shipping, to maintain the system of quarantine rather than expose ourselves to risks which cannot as yet be gauged.

I do not suppose that there will be any difference of opinion among Australians about the necessity of maintaining a strict quarantine against the more contagious disease, smallpox. Hitherto, except in one or two instances in neighbouring colonies, we have been able to bar the doors of Australia against the entrance of this pest. The exceptions have been caused by evasion or neglect; but fortunately the colonies in which they occurred were able to stamp out the disease in its earliest advances. In South Australia proper our quarantine arrangements are such that it is improbable that smallpox will find an entrance at our ports; but in these days of rapid steam communication, when the principal capitals of our colonies are brought within one or two days of each other, a danger to one colony is a common danger to all, and if smallpox break through any one of our barriers, the facilities for land communication are so great that it would be impossible to prevent the whole group

becoming affected. Hence the necessity for some combined action for federal quarantine which shall enable us to meet the danger at the earliest opportunity, when infected ships are approaching Australian coasts. I believe we have not much to fear from ships approaching us by way of Cape Leuwin. Our weak point is in the direction of the northern and north-eastern ports. A glance at the map shows us that our Northern Territory and the northern ports of Queensland lie dangerously near to thickly-populated countries which are seldom or never free from smallpox. The Chinese from these countries keep up a constant immigration into our northern ports, and the duration of the voyage is less than that of the incubation stages of the disease. It is therefore possible that a patient may become infected with smallpox in Hong Kong or Sumatra, may sail to our Northern Territory, land there, mix with the population, and be lost sight of before the outward signs of the disease become manifest. Two such cases have happened within the last three months. On the 1st June the Port Victor left Sumatra, and arrived at Port Darwin on the 9th. I have obtained copies of the answers given by the captain to the health officer, and find nothing to excite suspicion. She sailed from Port Darwin, and arrived at Sydney on the 20th. She was inspected, and passed as a clean ship. On the 28th one of the passengers sickened near Sydney with smallpox. On the 31st July a Chinaman is found in one of the streets at Port Darwin covered with smallpox, and on inquiry it turns out that other cases have been secreted by the Chinese there, and that the first sufferer became ill a few days after landing from the Port Victor, in which he arrived from Sumatra. On the 27th July the ship Tsinan sailed from Hong Kong, and arrived at Port Darwin on 6th August, and at Sydney on the 19th. On arrival at Sydney a passenger is found affected with smallpox. On the 27th August a man is brought into quarantine at Port Darwin. It is found that he was a passenger by the Tsinan, had travelled 30 miles inland to a railway camp, and had commenced working there before the smallpox appeared on him. We see, then, that we have a serious danger to contend with. Our Governments have proclaimed some of the ports whence the Chinese emigrate as infected, but we require besides this a system of federal quarantine, with its station at or in close proximity to Port Darwin, where the strictest inspection shall be made, and where no vessel shall be allowed to pass on until all risk of its bringing infection shall have ceased.

I confess that I am not without misgivings that in spite of all the barriers we may set up, smallpox will sooner or later become endemic in Australia. In New South Wales it has more than once got

beyond the quarantine grounds, and on one occasion the Government spent, as I am informed, more than £100,000 in arresting it. Victoria has had similar experiences, and in South Australia three or four years ago, a patient crossed our borders from Victoria and infected a few persons at the Police Station, where he was confined. We were fortunate in isolating the patients in one building, and the cost of stamping out the disease was something under £500. We must, therefore, not be over confident in our security, but must be prepared for attack by availing ourselves of every defence which gives promise of increased protection. A little less than a century ago Jenner discovered—empirically, if you will—that lymph taken from certain pustules found occasionally on the udders of cows has the effect, when introduced into the tissues of a human subject, of producing a mild form of disorder, which affords an almost certain protection for many years against an attack of smallpox. It is only within the last few years that bacteriologists have hit upon the probable scientific basis of this discovery. It is now known that the germs of some diseases can be modified in their degree of activity by a change of conditions under which they grow. Among other things it is found that the same germs passed into the bodies of some kinds of animals have their virulence increased, and that if they be passed through other kinds of animals their virulence is diminished, although their protecting influence from further attack remains unimpaired. You will remember that it is on the basis of these discoveries that Pasteur has adopted his preventive treatment against hydrophobia, of the astounding success of which an English Commission has just reported. Klein also has reported similar modifications of the germs of Anthrax. It is probable that vaccine in the cow is a modification of the smallpox virus as we find it in man. Whether this be so or not we have overwhelming evidence, gathered in all countries, that wherever the practice of vaccination has been extended, the ravages of smallpox have diminished, and there is reason to believe that vaccination places in our hands a means of prevention which properly availed of will afford our population the fullest security against attack, even though our quarantine arrangements may be found ineffectual. The efficacy of vaccination in preventing smallpox in children has been so clearly demonstrated that in the more advanced countries a compulsory vaccination law has been enacted. I am not fond of compulsion, but knowing as we do that in any country where smallpox exists an unvaccinated child is a dangerous child, there is much to be said in favour of this compulsory enactment. I am aware that it is not uncommon for parents whose experience does not reckon back-

ward for more than 20 to 25 years to underrate Jenner's discovery, and that some are bold enough to assert that the practice of vaccination has inflicted more mischief than it has prevented. Those of us who have become gray in the service and remember the frightful ravages of smallpox in our younger days when vaccination had not been generally adopted, and who can compare the past with the present, will be best able to estimate objections of this kind. But for the information of younger members it may be worth while to quote a few figures which are still preserved in the public records. At the close of the last century the number of deaths from smallpox in London was 92 in every 1,000 deaths from all causes, and it was estimated that in Europe the annual mortality from smallpox approached half a million. At the beginning of the present century when vaccination was voluntarily adopted by numbers of the community the ratio fell from 92 to 45 per 1,000 deaths. In 1847 the Government provided for gratuitous vaccination, and in 1854 vaccination was made compulsory, although it was not very strictly enforced until 1872. During these later periods the ratio of deaths from smallpox fell from 45 per 1,000 of all deaths to an average of 14. That this was not due to the disease losing any of its former virulence is shown by what occurred while I was in London in 1881. In that year the English census was taken, and it was found that in the metropolitan district there were of children under 10 years old 916,784 who had been vaccinated and 55,000 who were unvaccinated. In that year there was a rather severe outbreak of smallpox, and mark what followed. Of the 55,000 unvaccinated children 782, *i.e.*, one in 70, died through this disease. Of the 916,784 vaccinated children only 125, *i.e.*, one in 7,300, died from the same cause. We are all ready to admit that vaccination with impure lymph or without care may give rise to serious or it may be fatal results. I saw the other day an extract from the returns of the Registrar-General of England showing that within a given period 271 children were reported to have died of cowpox, or the effect of vaccination. This is a startling return, but when it comes to be examined it turns out that the greater number of these deaths have been caused by erysipelas brought on chiefly through neglect. Take the figures in their worst aspect and assume that every one of these 271 deaths were due to unavoidable causes in connection with vaccination, how insignificant they become when we find that during the time covered by these deaths no less than 3,800,000 had been vaccinated, giving a mortality of one death in 10,000 cases. The London figures I quoted a moment ago show that the mortality from smallpox among unvaccinated children is one in 70. Taking the experience of 1881

as our guide if these 3,800,000 children had remained unvaccinated 5,400 in round numbers would have died from smallpox instead of 372 from the combined result of smallpox and vaccination.

I recognise the requirement that if vaccination is to be compulsory parents have a right to expect that the lymph be carefully selected. In South Australia no lymph is sent out which is not vouched for by a medical practitioner or examined at the Central Office. We are sometimes obliged to teach police troopers or their wives in far-away districts to insert the lymph, but we never allow them to use any of their own selection. With the exception, therefore, of a few quack doctors who have induced the Government to appoint them as public vaccinators, we have the guarantee that vaccinators are using lymph of approved quality. We have no station for calf vaccination, but we are able to obtain calf lymph occasionally from outside sources. With a view still further to remove the objections of parents who dread contamination with the germs of other diseases, I have for some months past been working with the object of producing pure vaccine lymph by cultivation after the mode adopted in bacteriological researches. I am now able to grow in test-tubes vaccine which, as was demonstrated this morning, has all the morphological character of pure lymph, but as yet opportunities of practically testing its efficacy have not presented themselves.

I have exceeded the time I had allotted to remarks on the subject of smallpox. The pressing danger with which we are threatened must be my apology. I pass on to a brief notice of typhoid fever—a disease already existent in our colonies, and against which, therefore, no quarantine regulations can avail. We must admit, to our shame, that this fever has not only taken up a permanent home in our midst, but that it threatens to become even a greater scourge here than it has proved to be in the mother country. I say to our shame, because it is proved beyond doubt that filth and typhoid are intimate associates. Whether the germs of typhoid can be created *de novo*, or whether innocuous germs can be changed to typhoid germs in the midst of accumulated filth, or whether, as is more commonly believed, before typhoid be generated some pre-existing germ must be introduced, are questions that may interest us as scientists, but which it is not necessary in this place to discuss. It is sufficient for us to know that the contagion of typhoid exists in the dejecta from patients who are already suffering, and that it is owing to these dejecta being allowed to contaminate the air, the soil, the food, or drink of the inhabitants of the surrounding neighbourhood that others become affected. When I speak of filth, I am not questioning the habits or cleanliness of families in which typhoid may appear—

too often they are the unfortunate sufferers from the negligence of others. The contagion may be carried miles away from the homes of the affected. It may be introduced into our houses from dairies at long distances. I have seen this occur twice in the neighbourhood of Adelaide. It may contaminate our wells or other sources of water supply by percolation from closets or by drainage from the surface. It may lie dormant in the soil for an indeterminate time, or it may poison the air either from leakage of closet pipes or from cesspools where faecal matter is allowed to accumulate. By these and other similar means the disease is propagated. Our experience in South Australia has demonstrated that sanitary authorities can do much to arrest the progress of this disease wherever it occurs. There is no disease which can be more readily stayed, if promptly followed by a strict observance of instructions which Boards of Health are in the habit of issuing in districts where it makes its appearance.

We must pass on to the last and more practical division of our subject—the machinery by which the State can most effectively exercise its powers for the preservation of the public health. In all the Australian colonies we have copied the example of the mother country, and have entrusted the administration of sanitary laws to Local Boards of Health, these being more or less under the supervision of a Central Board. The Local Boards are formed by the Town or District Councils of their respective localities. In South Australia the Central Board administers the Health Acts in places where no Local Boards have been appointed. The Local Boards have large powers for the removal of nuisances, the cleansing of streets, the scavenging of towns, the making of private roads, the prevention of adulterations of food, the drainage of private houses, and the prevention of overcrowding. The Central Board has further powers to make such regulations as it may deem expedient for removing or preventing the spread of infectious diseases. Questions of quarantine are also referred to it. It has also powers to set on foot any inquiry it may think fit relating to the public health, and to compel the attendance of witnesses. It may also direct the Local Boards to do anything that may lawfully be done to carry out the provisions of the Health Acts. The administration of the Vaccination Act is also in the hands of the President of the Board. By means of the Local and Central Boards we have undoubtedly made vast strides in the way of sanitary improvements, but when we turn to the returns of mortality from preventible diseases we feel keenly that the work that yet remains to be done is far in excess of anything we have yet accomplished. The question is in what direction shall we look for improvement? I feel that I shall be opening up a somewhat delicate

question when I say that the principle of appointing members of Corporations or of Shire or District Councils to be the Local Boards of Health does not commend itself to my judgment as satisfactory. Gentlemen who are elected to fill the office of Councillors are elected because they are supposed to have good general qualifications for the management of municipal affairs, while their abilities to become guardians of the public health are seldom or never taken into consideration. Hence a Council may be very apt at municipal affairs, but may have neither the will nor the ability to perform efficiently the duties of a Board of Health. If the two qualifications happen to exist in the same Council the combination is an accidental one, and liable to be broken every time there is a new election of members. As a rule the duties are performed in a loose manner, attention to the public health being held by members and officers as subordinate to the other duties of the local Councils. In the annual report of the Victorian Central Board just published I find charges of neglect against some of the Local Boards, which if time permitted I might quote in support of the opinion to which I have given expression. In South Australia during the last eight years two modes of dealing with Local Boards have been adopted. During the first four of these years it was the policy of the Central Board to leave the Local Boards pretty much to themselves, to take for granted, unless complaints of negligence were received, that they were doing their duty. During the last four years the Central Board carried on a systematic inspection of places under local jurisdiction, and when necessary the Local Boards were called on to take action. Mark the difference in the work. In the first period the Local Boards served 12,172 notices for the abatement of nuisances prejudicial to health. In the second period the number amounted to 16,248. If we exclude Adelaide, where during both periods the influence of the Central Board was directly or indirectly felt, we get this result:—The country Local Boards served during the first four years 3,887 notices, while in the last four the number was 10,245. Some little allowance must be made on account of the number of Local Boards being rather larger during the second period than the first, but the effect on the figures is scarcely appreciable.

Let there be no misunderstanding here. I do not wish you to believe that Local Boards have obstinately refused to discharge their duties when they have been pointed out to them. I know of but one instance where a Board was dissolved at its own request because it was unwilling to act. Speaking from experience, I have every reason to be satisfied with the courtesy and sometimes the thankfulness with which the recommendations of the Central Board have been received.

What I contend for is that the public health is too sacred a thing to be committed to the care of gentlemen who, not being impressed with its importance, place it in a secondary position. If we must have Local Boards, let us have men selected on account of their knowledge of sanitary laws, and who will act independently of local influences. Under any circumstances there must be some central authority armed with the fullest powers to control and direct the local bodies whenever action is desirable. There must be no hesitation, no waiting for red tape dalliance, for in all questions of public health delay means danger. I am not wedded to any particular mode of constituting this authority. I have a leaning towards placing it in the hands of a Minister of Health, to whom all other authorities shall be subordinate; but whether we have a Minister of Health, or a Local Government Board as at home, or a Central Board of Health as in Australia, the power should be placed in the hands of men whose knowledge entitles them to speak with authority, who possess the full confidence of the people, and whose actions shall be prompt, free, and independent.

Time would fail me if I were to enumerate the many duties which a properly constituted health authority may be called on to perform. Every day brings its work, and let us hope that every day will bring also improved methods of doing it. While we retain all that is good in our past operations we must be ready to accept whatever is of promise in the future. Among the new methods there are two which Australia has not yet adopted, but which are regarded by sanitarians at home as the most important of recent advances. I refer to the registration of infectious diseases, and to the undertaking, under the authority of the State, of original research into the etiology of disease. Registration is dependent on notification. In England, although there is no provision for compulsory notification in the Health Acts, no less than 48 of the more populous towns have obtained local Acts providing that the occurrence of any cases of infectious disease must be notified to the health authorities, either by the doctor or the householder, or by both, so soon as it is diagnosed. In some parts of America the notification is required so soon as the disease is suspected. Early information enables the authorities to take immediate action to put out the fire as soon as the first glimmer of the conflagration is discovered. It is impossible to overrate the advantage of this timely notice. In the Victorian Health Act the compulsory notification of dangerous infectious diseases has been thrown on the householder, but from some complaints in the last report of the Central Board, I suspect there has been some hitch in securing it. In this colony, about three

years ago, the Attorney General carried a Bill through one branch of the Legislature, which would have secured all that was necessary, but it was so "improved" before it became law that our Central Board is able to insist on the notification of only some three or four diseases, which never have been, and I trust never will be, found in our midst. Hence, except when some good Samaritan voluntarily gives us information, the first knowledge we obtain of the prevalence of an epidemic disease is the record of deaths sent from the Registration Office; too late for that timely grip by which, in all human probability, we should have been able to arrest its progress. I am no advocate for over legislation, or for thrusting an unpopular law on an unwilling people, but I am convinced that this compulsory notification must be one of our next steps in advance, and that whenever our legislators shall be pleased to require it common interests will lead to a general compliance.

The prosecution of original researches into the etiology of disease has come to be recognised in the old countries as an important duty to be undertaken by central authorities. The work of Koch in the laboratory of the German Board of Health and his journey to Egypt and thence to India to bring his special mode of investigation to bear on the etiology of cholera will be fresh in your memory. You will also have in your minds the work of Klein in the many investigations he has undertaken at the instance of the chief medical officer of the English Local Government Board, culminating in that series of experimental investigations into the relation of scarlatina and certain diseases of cows, for the final reports on which we are all on the tip-toe of expectation. Every discovery which increases our knowledge of the causes of a disease, brings us a step nearer to a knowledge of the means to prevent it. This work is not that of the private practitioner, nor in some cases is it desirable that while engaged in it he should undertake practice. The whole nation has an interest in it, and therefore it is the right work for a Government department to undertake. In Australia we have many questions relating to the public health which await solution. How much yet remains to be known of hydatids, notwithstanding what our workers have already brought to light. What a broad field opens up before us in inquiry into the relation of tuberculosis in the lower animals to phthisis in man; into our infant mortality; the prevalence of typhoid; the influence of climate, and many other subjects on which we need more light. We spend money lavishly in destroying our rabbits or our sparrows. We protect our crops, our stock, and our grass. Is man of less value than these? Is it too much to ask that some little of the country's expenditure shall be given for the

protection of human life, or that money be expended in searching out the causes of disease from which every one of us is liable to suffer? I have faith in human progress, and I look forward to the time, and that not far distant, when an intelligent community shall awaken to the importance of the work we have in hand, and when every Australian central authority shall have its staff of competent observers fully occupied in investigations which shall prove of the highest value in promoting the physical well-being of our people.

In opening the proceedings of the State Medicine Section, the CHAIRMAN (Dr. Whittell) said—I do not purpose in my introductory remarks to do more than welcome those gentlemen from the other colonies who are here. Some of them are known to us by name. For a long period we have known their writings and the interest they have taken in State Medicine. No doubt we shall be able to derive from them much instruction, and that we shall be able by the interchange of thought to settle some of those differences of opinion which must necessarily arise in connection with State Medicine. I call on Dr. Stirling to read his paper.

THE STATE, THE PRACTITIONER, AND THE PUBLIC.

[By E. C. STIRLING, M.A., M.D. Cantab, F.R.C.S., Eng., Lecturer on Physiology in the University of Adelaide, Surgeon to the Adelaide Hospital.]

From time to time during the last few years we have witnessed, both in Great Britain and the Australian colonies, strenuous efforts made by various medical associations to induce the Legislature to undertake a greater control over certain matters in which the medical profession is peculiarly interested. Though, to some extent, the contentions of the profession have been admitted, and its recommendations carried into effect, it is notorious that there are still many points on which medical practitioners think, that as a body, they have neither received the consideration they deserve nor, as the apostles of public health, that their recommendations have been so frequently recognised as in their opinion should have been the case.

The claims that have been put forth group themselves round two chief points. In the first place, there has been a number of suggestions variously expressed, but when taken collectively amounting practically to the dictum that it is the duty of the State to take care

of the health of its subjects by more direct, stringent, and frequent intervention in sanitary matters. Secondly, it is claimed that the State is also bound to protect the general public as individuals by prohibiting, or at least strongly discountenancing, the professional dealings of quacks, impostors, and other incompetent persons.

With the former of these contentions I think the public generally is not out of sympathy. It has at least received acknowledgment in various ways in the enactment of such laws as those relating to quarantine, vaccination, drainage, repression of nuisances, and to various other matters connected with the public health; and of the laws in question I think it can safely be said that their aggregate effect has been immensely for the public good. Indeed, so long as it is admitted that compulsion is permissible in the matter of the training of the public mind, the production of the *corpus sanum* may also be considered as a necessary adjunct and antecedent to that *mens sana* which the State is now at so much pains to create.

This, of course, opens up a wide field of argument, for in the first place there are many acute thinkers, of whom Herbert Spencer is the most eminent, who do not admit the advantage, or even the right, of the State to make any such compulsory enactments, and, indeed, if it be conceded that it is the duty of the State to protect the health of its subjects, where is legislation in this direction to stop? The maintenance of health does not depend merely upon the absence of virulent epidemic diseases, which are those against which the legislative arm has been chiefly raised, but also upon the fulfilment of a variety of other conditions, many of which, even in these days of government intervention, are admitted to be outside the sphere of legislation, though he would be rash indeed who would declare that further curtailments of individual liberty in this direction are not in store for us in the near future.

Though we may very properly invoke the aid and admit the right of the State to repress all such acts as result in the contamination of the elements, such as air and water, of which we all enjoy the use in common, to which may be added actions which give rise to the spread of disease by careless, culpable, or wilful neglect of certain precautions; yet between this course, which is simply a repression of nuisances, and a strict supervision of private conduct that would be intolerable, it becomes exceedingly difficult to draw a line, that shall exactly indicate the limit of legitimate State interference. Even now we are forced to appreciate the difficulty of defining this line and the anomalies which result from the attempt. Under the last South Australian Public Health Act of 1884 the members of the medical profession are, under penalty, required to report the

existence of certain infectious diseases (smallpox, cholera, plague, and yellow fever) so that precautionary and remedial measures may be at once taken. The diseases in question are no doubt virulent and dangerous, but with the one exception of smallpox they were entirely and probably remotely prospective, while other diseases, such as scarlet fever, diphtheria, and enteric fever, not only scarcely less formidable, but also existing in our midst, and being above all things eminently susceptible of complete or partial eradication by preventive measures, were allowed to go untouched by the actual scope of the Act in question.

In this respect, I think, the attitude of the medical profession has not been quite consistent with their position as the guardians of public health. There is in the minds of many medical men a tendency—a very creditable tendency in some ways, no doubt, but, I think, an unwise one—to see only in such enactments a disruption of the confidential relations between practitioner and patient. I do not think such relations would be in the least disturbed, or even strained by the notification of this class of disease; and when we consider how distinctly the progress of science and sanitation points to prophylaxis as the great means of eradicating infectious and epidemic diseases, and that the efficiency of any prophylactic measures must depend largely upon the promptness with which an immediate knowledge of the environment enable them to be taken, I think it would be well to encourage rather than to resist attempts to extend the principle of the notification of disease.

But the interest of the subject has tempted me to digress. It is not my intention in the present paper to discuss the admittedly difficult and rather philosophic question of the relations of the State to medicine as a science, a matter which opens up among other things the whole question of the proper sphere and limitation of the functions of Government. I trust, however, that it will not be left untouched by some member of our body on this very favourable opportunity.

My present object is rather to deal with the subject of the relations of the State to the practitioners of medicine, and of these to the public, and to invite discussion on the question how far the profession is justified, or is wise, in seeking from Government what undoubtedly amounts to a certain measure of protection against the army of quacks and impostors who find a veritable happy hunting ground in these Australian colonies. Whilst I am mindful that my first duty is to address myself to my medical brethren, I trust I need make no apology for making my remarks intelligible to that

larger audience, the public, who obviously with ourselves possess an interest in the question.

While, as I have already said, the frequent representations that the State should extend and consolidate its jurisdiction in the matter of sanitation, with but occasional exceptions, meets with tacit or expressed approval, the same cannot be said of the suggestion that the State should take care of the public as individuals by protecting them against possible malpractice or fraud on the part of the unqualified practitioner. The public, in whose interests this proposal is ostensibly put forward, persists in recognising in it only self interest on the part of the profession, and to a large extent declines, with anything but thanks, the suggested protection. It, the public, insists in seeing in the suggestion only an attempt to extend to the medical profession the most objectionable features of Trades Unionism. A similar suspicion, not always unexpressed, attaches itself, here as in the other colonies, to the minds of our legislators, and as South Australian members of the Congress know it has hitherto been found impossible to obtain a medical Act which is satisfactory to the members of the profession. Precisely the same difficulty has occurred in the other colonies, but in none has there been so great a resistance, both passive and active, to overcome on the part of the legislature as there has been here. And the result is that with the exception of New South Wales, where some entertaining revolutions have been recently brought to light as to the extent to which unqualified practice is carried on, the law is perhaps more unsatisfactory here than in any of the other colonies, though I think the recommendations to the Government of the profession in South Australia for a new Bill are at least as liberally conceived as in those.

Now, it is a perfectly natural thing that the qualified man, whose education has cost much time, study and money, should think it hard that his potential fees should be diverted into the pockets of some unqualified practitioner, whose best recommendation to the indiscriminating public is too often the fact, that he is not encumbered with any testimony of his fitness; and it is equally natural that, like other but more successful sections of the community, he also should desire some measure of protection, but I am far from saying that this feeling is the mainspring of their contention.

Speaking now to the public rather than to the profession, there are few medical men of considerable practice, particularly if they be surgeons, who are not familiar with shocking instances of malpraxis, both culpable and criminal, on the part of unqualified men and women, which has led not only to permanent maiming but also to fatal results; and though I at once freely admit that the

possession of a recognised diploma is no absolute guarantee of successful treatment, yet it appears to be obvious that in the practice of medicine and surgery some lengthened period of systematic training under tried teachers is an eminently safer criterion of efficiency than no special training at all, or at best very little. And I should have thought that this much would have been admitted and recognised by the public, who, in the choice of their legal advisers, usually display no want of discrimination, but it appears to be by no means generally the case.

That there are some undoubted instances where a bone setter or other empiricist has effected a cure, or given relief where the qualified practitioner has failed, perhaps none of us can deny, and it is of these cases that the public hears so much, but it does *not* hear of those numerous instances where permanent deformity, or loss of limb or life has resulted from the ignorant and rash manipulations of the "bone setter," and so the public mind is ready to fall into the error of considering that in all cases the unqualified practitioner is a safer guide than he who is qualified, and if the unqualified practitioner should happen to be a foreigner, or the blatant exponent of some special and empirical mode of treatment, so much the more competent is he considered to be by a large number of persons.

I make these remarks not by way of giving my adherence to the suggestion that practice by all this class of quacks and impostors should be prohibited, but to express my belief that the public is unjust in its suspicion that the recommendation in question is based solely on the self-interest of the profession, rather in my opinion does it rest upon the actual and intimate knowledge possessed by so many of us of the irremediable mischief that is wrought. Cases of malpraxis by unqualified persons are rarely brought to light, partly because, as will afterwards be shown, we in this country, with extraordinary laxness, that has been over and over again pointed out, have left the way open for insufficient and incompetent evidence as to the cause of death, and partly because the cases in question when recognised are not often revealed, so that as the result of a generous but perhaps unwise reticence on the part of the qualified man, his unqualified rivals are left to be judged only by their occasional successes.

All this is no fancy picture, as many here can testify, and especially do I wish to express my deliberate opinion that the acceptance of death certificates from unqualified persons leaves a distinct loophole for malpraxis, and if to malpraxis I were to add foul play I should most undoubtedly be confirmed by the experience of some here to-day.

It is not possible either, in the face of the increasing difficulty in earning a livelihood which is experienced by so many men of good education and tried capacity, to withhold a large amount of sympathy from those who chafe sorely at the abundant financial success achieved, and at the ease with which a confiding public is imposed upon, by such shameless quacks as the individual who advertises himself in the press of a neighbouring colony as—

“DR. W. PERCY BURNARY, 180, Pitt-street, Sydney, a relative of the lately deceased Colonel Burnaby. Every quality of disease treated with miraculous success; the Doctor has never failed to cure the most complicated diseases. At his lectures during the evening the Doctor will sing his local song on the Chinese question, and give an unfailing recipe for the growth of the hair. Ladies and gentlemen matrimonially mated on the stage, and other evidences given of the wonderful science of phrenology.”*

And this is the kind of man we read of as making his fifty or a hundred thousand pounds in a very short time by the practice of his calling!

In spite of this and many other instances of rampant quackery, my own opinion is, and has been for some time, adverse to the plea for its prohibition so far as it is put forward for the protection of the general public. To the question how far State intervention may be in my opinion justifiable I will shortly return, but as a general principle I think it is very much better that the public should be left to take care of itself in this, as in many other matters in which a meddling Government sometimes seeks to interfere. I most willingly and cheerfully concede to the public its unrestrained liberty to be killed or cured, maimed or mended in any way it thinks fit, and to any man, however unqualified, the liberty to ply his calling if, without *fraud or false pretences*, he can prevail upon silly people to employ his services. The words in italics are significant and reference will again be made to them.

This is the view I have always advocated on the question, though I am well aware that it is not in entire accord with that held by many of my medical brethren, for whose motives and opinions I have the highest respect, and who will probably express their dissent to-day. Once, however, admit the duty of the State to interfere with the freewill of the patient in his choice of a medical attendant where is the intervention to cease? Is a man racked with colic or with toothache not to be allowed to go to the nearest chemist or to any one else who can compound or suggest a soothing draught which shall relieve the acuteness of his suffering; or is the chemist to be prohibited from offering such alleviation? Do you propose by legislation to interfere with the almost prescriptive rights of grand-

* Bruck's List of Unregistered Practitioners, Sydney.

mothers, aunts, and mothers-in-law in their diligent administration of domestic remedies? The thing is impossible even in these days, but if you admit the legality of these particular actions you admit the whole principle of unqualified practice. I believe on reflection the medical profession will see that to prevent unqualified practice would be quite impossible, and that to make the attempt would be unwise, partly because it is a bad thing to make laws which cannot be enforced, but chiefly because in these days we have every reason to resist, rather than to encourage the kind of legislation which may well be termed grandmotherly.

In framing certain suggestions for a new Medical Bill last year, which as usual, failed to receive consideration, no attempt, I am glad to say, was made to put forward the claim for prohibition, and the fact stood broadly out that, while undoubtedly seeking and urging reform on certain points there was no expression whatever of a desire on the part of the profession that the State should in any way intervene between the public and its unfettered choice of an attendant.

This naturally brings me to a consideration of those points on which we are unanimous in thinking that we may rightly and reasonably ask for reforms at the hands of the State. There are five principal points which have at different times been contended for by the profession in South Australia without success. These may be thus briefly stated—

1. The State should accord the *ægis* of its protection to qualified practitioners only, and should at least discourage, if it does not entirely prohibit, practice by those who are unqualified.

2. The assumption of professional titles and qualifications by persons who possess none should be punishable, like other fraudulent pretences.

3. Medical certificates of the cause of death should be received only from duly qualified medical men.

4. The definition of what constitutes a qualified medical practitioner should be more strict, and the Act should not leave, as it does now, a loop-hole for bogus diplomas, or diplomas obtained under circumstances which are absolutely conclusive that there can have been no complete or systematic course of study. The constituted authority which determines the issuing of certificates of registration as a legally-qualified practitioner should equally have the power of cancelling or suspending them.

These are the main contentions. As to the first, I have already sufficiently indicated that if it is taken to mean that the State is to prohibit practice by unqualified men, I am personally not in sympathy with it, nor, as I have said, do I think the profession generally

desire to go so far. To what extent, if any, is it desirable or reasonable that the State should go in this direction is, as usual in such matters, a very difficult question; and as an endeavour to answer it I will make no apology for quoting *verbatim* some remarks of Professor Huxley, himself a medical man, though medicine has been a distinct loser by the diversion of the acute intellect of his mature years to the domain of pure science.

Professor Huxley in writing on this subject says:—"In my judgment the intervention of the State in the affairs of the medical profession is to be justified, not upon any pretence of protecting the public, and still less upon that of protecting the medical profession, but simply and solely upon the ground that the State employs medical men for certain purposes, and as employer has a right to define the conditions on which it will accept service. It is for the interest of the community that no person shall die without there being some official recognition of the cause of his death. It is a matter of the highest importance to the community that in civil and criminal cases the law should be able to have recourse to persons whose evidence may be taken as that of experts; and it will not be doubted that the State has a right to dictate the conditions under which it will appoint persons to the vast number of naval, military, and civil medical offices held directly under the Government. Here, and here only it appears to me, lies the justification for the intervention of the State in medical affairs. It says, or should say, in my judgment, to the public, 'Practice medicine if you like—go to be practised upon by anybody;' and to the medical practitioner, 'Have a qualification, or do not have a qualification if the people don't mind it; but if the State is to receive your certificate of death, if the State is to take your evidence as that of an expert, if the State is to give you any kind of civil, military, or naval appointment, then we call upon you to comply with our conditions and to produce evidence that you are in our sense of the word qualified. Without that we shall not place you in that position.' As a matter of fact, that is the relation of the State to the medical profession in Great Britain. For my part I think it an extremely healthy relation, and it is one that I should be very sorry to see altered, except in so far that it would certainly be better if greater facilities were given for the swift and sharp punishment of those who profess to have the State qualification when, in fact, they do not possess it. They are simply cheats and swindlers like other people who profess to be what they are not, and should be punished as such."*

* *Nineteenth Century.*

Now this, I think, is a robust and liberal view to take of the whole matter, and it entirely expresses my own opinion, but broadly liberal as it is, it admits two at least of the contentions of the profession in this colony.

The death certificate form in South Australia expressly sanctions and suggests that the return of the cause of death should be made by any unqualified person by the words "*qualifications, if any,*" which follow the space left for signature. I look upon these words as a standing insult to the profession, and an absurdity in face of the chief objects to be achieved by the document in question. Apart from the question of obtaining the best expert evidence that there has been no foul play, on which I will not dwell at present, surely if the returns are worth anything at all they are valuable as being the basis of vital statistics from which important conclusions are hereafter to be drawn as to the prevalence and distribution of disease, and it is, as Professor Huxley so truly says, of the highest importance that such returns should be reliable; if absolute accuracy is, perhaps, unattainable by any regulations that could be devised, returns by ignorant persons must be assuredly a feeble basis for generalisations.

As an instance of how absolutely valueless these may be I may mention that I saw not long ago the cause of death certified by an unqualified practitioner of this country as "cessation of breathing"—a return which it must have puzzled the Registrar-General to classify.

I admit, of course, that in a very scattered community it is often impossible to obtain the attestation of a duly qualified medical man, and under such circumstances, other testimony as to the *fact* of death must be received; but as to the *cause* of death it is, I think, only reasonable to ask that for statistical purposes those certificates only should be received which are signed by qualified medical men, and that all others should be classed amongst the uncertificated deaths. The present Registrar of births, deaths, and marriages, the Chairman of this Section of State Medicine, has very properly taken this course, but I can see that he will require all the support that the profession can give him, for it is a very remarkable thing, and scarcely creditable, that some of our Governments are much more prone to yield to pressure brought to bear on them by, and on behalf of unqualified persons and quacks than to defer to the recommendations of members of the profession, or even it may be of their own officials. So too, I do not see how any reasonable objection can be taken to the request that the State should prohibit the assumption of qualifications where none exist. Other fraudulent pretences

are punishable, and I see no reason why any individual who advertises himself as the possessor of a diploma which he does not possess should escape the penalty both swift and sharp, which even the liberal view of Professor Huxley admits is rightly his due.

Lastly, we urge the State to be more strict in its definition of what constitutes the right to being considered a properly qualified medical man, and the question undoubtedly presents some difficulties—difficulties which have arisen chiefly through the notorious insufficiency of the curriculum in certain American institutions. Though very great reforms have recently taken place by the suppression of bogus diploma-conferring establishments, there are some so-called medical colleges which still continue to grant their diplomas after a notoriously inadequate training. And even in some of the schools which are of undoubted respectability, whose degrees it might seem at first sight presumptuous not to recognise as carrying the same permit to practice here that they do in their own country, there is no doubt whatever that the period of study required by them is much too short to insure a competent knowledge of medicine and surgery with all their branches. But I think our position ought to be clear. Our own medical school, and those of Melbourne and Sydney, have wisely set themselves above suspicion in this respect by exacting from their students a course of training which, by its duration and character, is in advance of the requirements of many of the older institutions, and in common fairness to their own graduates the Governments of these countries should not haste to be content with a standard that is far behind their own.

The *minimum* period of training before a qualification to practice can be obtained is, in most of the British and European Universities, four years, as my hearers know well; in some, Cambridge and London for instance, it is five years, which extended period is gradually being adopted elsewhere, as, in fact, is the case in these colonies; yet some surprise, and not a little indignation, has been expressed that a single year's training, which has been supposed to cover the whole enormous range of medical science, is not held to constitute the right to be considered a duly-qualified medical man, because, indeed, the individuals claiming it are armed with a so-called diploma. I, for one, as I have said, raise no objection to the right of the public to avail themselves of the services of such individuals, nor to those with, or without a diploma of any kind to practice; but I do think that the voice of medical men who have served their long and arduous apprenticeship may be justly raised against the assumption that these unqualified, or insufficiently qualified persons, should equally with themselves be considered as medical experts, and that it

is not right that the law should be practically powerless to reach those who deceive the public by assuming qualifications they do not in fact possess.

With regard to the question of cancellation or suspension of certificates, it is surely an anomaly that the Medical Board appointed for the purpose of issuing licences for registration, on proof of fitness, should not also have the power of withdrawing them on adequate proof of unfitness. But yet this is the case here, and as I understand, it is so in New South Wales also. Thus it happens that where for some infamous conduct the very diploma or qualification on which the certificate of registration was issued is withdrawn by the Corporation which originally granted it; or even in the extreme case of conviction for a felony or misdemeanour in a court of law, there is no power to remove the name of such offenders from the list of duly-qualified practitioners. This is an aspect of the medical profession on which I do not care to dwell, but we cannot shut our eyes to the fact that cases such as these have happened, and will happen again, and it is equally clear, I think, that some provision ought to exist for dealing with them. The medical profession has its scoundrels and criminals as well as other callings, though to its credit it can be said that they are comparatively few in number, and I can see no Pharisaism in asking that its generally honourable character should be recognised by the application of the simple and legitimate remedy which is sufficiently indicated by the preceding remarks.

Recognition that each one of the claims herein set forth are reasonable has more than once been obtained from responsible ministers in South Australia, but the matter has progressed no farther than this bare recognition. That may be partly due to the more pressing exigencies of other legislation, but it is also partly due to reasons which are neither adequate or creditable, as those know well who have been behind the scenes, and so it happens that the medical profession in South Australia has been unable to induce successive Governments to undertake in earnest a medical Bill which shall even attempt to deal with the points in question.

This Congress, speaking not merely as the voice of the medical profession of South Australia only, but of united Australasia, may do a good deal in directing the attention of the various Governments to such matters as I have indicated, as well as to many others of a similar nature. Whether or not my own views may prove acceptable, and I know there are those who will dissent from some of them, I ask that the Congress shall speak its opinion with no uncertain sound, and had I not some experience of the *inertia* of Governments

in such matters, and of their amazing solicitude for the susceptibilities of the unqualified and their patrons, I should hope it would be with good effect. As it is I can only feel that I have imperfectly endeavoured to invite an expression of opinion on some questions of material interest both to the public and to a profession which cannot generally be accused of being addicted to selfish aims.

RELATION OF THE PROFESSION TO THE PUBLIC.

[By L. W. BICKLE, L.R.C.P., M.R.C.S., Mount Barker.]

The Jubilee Exhibition of South Australia now being held in Adelaide has been seized upon by the profession as offering a good opportunity for holding the first Intercolonial Medical Congress. The idea is a good one, and deserves the support of all the practitioners of the Australian colonies. It is another step in the way leading to the breaking down of those artificial and injurious barriers, now existing between the colonies, and which must be, sooner or later, swept away by their federation.

Side by side with other marks of progress in this great and now country we can honorably pride ourselves on the advancement made by our profession.

The newest drugs receive their trials, and the latest advances in surgery have their able exponents in our midst. Our hospitals are being rebuilt, or remodelled, in accordance with the latest discoveries in sanitary science. We have our branches of the Medical Association affiliated with the powerful mother Society, and we have a medical literature springing up and becoming yearly of more importance.

It is only reasonable and right we should take advantage of an occasion like this—which brings into our city men from all parts of “Brighter Britain”—to review our position, and take means for establishing freer communication between medical men of the various colonies, for the better publication of results of original research; and also to consider whether there are any points connected with our relations to the general public calling for reform, or for combined action to prevent abuses from arising. The purpose of this Congress will, I take it, be amply and nobly fulfilled if it only leads to the amalgamation of the various journals and records of societies, now published separately, into one powerful Australian

medical paper, which should command the sympathy and support of the profession generally, throughout Australia and the adjacent colonies. There would be a better chance offered for dealing with the vexed club question, which has so strong a hold out here. Clubs there must always be ; but that the existing state of affairs is a very one-sided arrangement is readily admitted by any intelligent member of any of the numerous orders. Its influence could also be used to lessen the undignified competition amongst medical men. Reforms in the laws relating to unqualified practitioners could be urged ; and questions relating to the safety of the general public from increased attention to preventive measures from a sanitary point of view.

The traffic in poisons and the anomalies of Coroners' Courts could be better dealt with by one such powerful journal than by the present divided forces. There are two sides to a medical man's life. The one the partly professional, or scientific, is receiving all due attention in the other sections. The other, equally deserving of notice, deals with the more prosaic question of ways and means ; and as these depend greatly on the touch or relation of the public to the doctor, I may be pardoned for venturing to allude to one or two points. The liberal education in arts required before students are admitted to the profession, the spread of scientific knowledge, and the wondrous strides, both in medicine and surgery, have together raised the status of the profession to its present respected position. Although willing enough to recognise this, a certain section of the public are wishful to go a great deal further, and to freely propose schemes in which medical men shall give their services for nothing, or next to nothing. To the heads of our body this matters little, but it has a very appreciable effect upon the rank and file of the profession. The chief form their efforts take at Home are in the direction of hospitals for this, that, and the other thing, and free and provident dispensaries ; but here it is the forming of lodges, tents, &c.

The latest effort in this direction at Home is the forming of a society for the treatment of special diseases. The promoters consist of peers, bishops, M.Ps., bankers, and others. The object is to give people of moderate means an opportunity of seeing certain specialists at a fixed fee of five shillings. A member writing to the *British Medical Journal* opposes this strongly, and says the same people would show a truer sense of philanthropy by paying the fees of their *protégés* themselves, instead of calling upon an already overtaxed, underpaid profession to make further sacrifices. The Secretary of the movement replies with the specious argument that the specialists

are to be junior men, and it is to provide them with work and pay at a lower rate till the guineas begin to roll in, but he makes no attempt to show what means are to be taken to prevent the certain abuse of the system which will immediately arise. The abuse of the hospital system is so great that measures are being considered to try and prevent them. This proposed association, which is quite unnecessary, would only pave the way for more. The principle is wrong. Why should any one body be supposed to be a fair mark for everyone to propose that they shall do this or that for nothing, or next door to it?

It is not as if doctors, as a rule, were a hard-hearted race—doing nothing without fee or reward—there is not a doctor living who does not do a lot of work for nothing; giving his best care and time to cases where he knows there is no chance of payment, and in other cases taking a merely nominal fee, lest he hurt the feelings of a poor and deserving patient. I am inclined to think that it is the frequency with which this has been, and is done, that has led to the readiness with which people propose to deal with our time and energies. In Australia the most prominent feature is the extent of the club practice. There are not only the Oddfellows, Foresters, and Druids, but we have family lodges, female tents, juvenile lodges, and juvenile female tents. To the new comer the extent to which this lodge system is carried is astonishing. He is amazed to find well-to-do and opulent men—Members of Parliament, lawyers, Government officials—not only ordinary members of a lodge, but expecting, and demanding, treatment as lodge patients. This should not be, and could only have arisen from a misconception of the origin of these Friendly Societies. As soon as this is cleared up, their own sense of propriety will lead them to place themselves on the *honorary list*. The Societies are founded to provide medical advice and comforts for those who are unable to pay for them, yet who possess sufficient independence to decline such assistance as paupers. The assistance of their more fortunate brethren of the monied classes was received from honorary members, who by a small annual payment, would supplement the contributions of the members, and would help to make the clubs financially sound. It was intended that any member becoming well off should join the ranks of the honorary class. The origin and inception of these societies are admirable; they promote habits of thrift and self-reliance in the labouring and artisan classes, and at the same time take a great load off the mind of the chief bread-winner of the family, as he feels that in case of accident or illness there will be some provision for himself, and for the temporal needs of his wife and family. I believe

at home there is some limit as to the position of men eligible for membership. It would not be easy to fix a hard and fast line. Yet there should be some discretionary power in the hands of the surgeon, in addition to the rejection for physical inability.

Next, as to family lodges. Should they be countenanced or not? Yes or No? In scattered country districts, No! In towns, especially manufacturing, or where large bodies of the artisan and labouring classes live, Yes! but under certain restrictions. There should be some limit as to financial position of the members, and the fee should be for a family of a certain size, with an extra payment for each additional member. It is certainly the reverse of fair that a family of eight or ten should only pay the same as one of three or four. Or a better way, I think, is, each visit or consultation at the house should be charged at a certain reduced rate, the lodge being responsible to the doctor for payment, he accepting this rate as a concession for the cash payment and absence of risk of bad debts. The lodge protects itself by making each member pay a certain percentage of his accounts; and this also serves in a great measure to protect the doctor from trivial calls.

As for the female and juvenile tents I fail to see any adequate reason for their existence as medical benefit societies.

I have mentioned before that members of these societies freely admit that they have the best of the bargain, and before leaving the subject I would point out one or two features requiring alteration, and which might be secured by a representative Committee of our members:—

1. There should be extra payment, based on a fixed scale, for all fractures, dislocations, and surgical work generally, such as obtains in the poor law appointments at Home.

2. That the present radius, which is exceedingly large, viz., five miles, be reduced to one mile in town and two miles in the country, and a fixed rate for mileage above this distance, say one-half or two-thirds the usual fee.

3. The amount paid is so small that it does not properly cover the cost of drugs. It would be advisable for the lodges to appoint their chemist at such remuneration as they may agree upon.

The question of unqualified men demands attention, both from our own and the public's point of view. Having passed the necessary time in study and undergoing the examinations for diplomas we have a right to expect the State to protect our interests. The public have an equal right to expect protection. The recent visit of the Canadian quack is a fitting example for the necessity for active legislation. That strange views are held by some in authority I cannot show

better than by relating an incident in which I was interested. In a mining town of New South Wales a certain "Sultan Khan," a quack eye doctor, induced a poor wretch to allow his eye to be cut about, on the pretence of removing a cataract, which would render him blind. There was a slight pterygium, but no cataract, and the only piece of any importance, namely, the cornea, was untouched. I gave evidence to this effect, but the Magistrate gave the "Sultan" a verdict for ten shillings less than he claimed, remarking that if people would go to quacks they deserved to be slated.

One more point, and I have done—and this refers particularly to South Australia—and that is the wondrous wording of the death certificate, where we find the words at the end, "Professional titles (if any)." One may well ask—Can such things be in the nineteenth century? It is time such an anachronism was done away with. It would seem to be an inducement for unqualified men to practice.

In conclusion, I must ask you not to suppose that this paper is intended to be an exhaustive one. I am well aware of its defects and shortcomings, but if it serves to open a healthy discussion on some of the points raised, and others bearing on our relationship to the public, I shall feel it will have accomplished its purpose.

Dr. ABRAMOWSKI (Terowie) said—Being a German, and of German education, I look upon this question from other points of view than most members of the Congress seem to do. Our way of looking at State protection, or the right of the State to interfere with the individual, is certainly more developed than yours seems to be. The English people as a nation seem to think individual liberty is the highest thing to be looked after; even a child is supposed to be the same as his father, and if the father chastises his child in such a way as a Justice of the Peace thinks too severe, the father may be punished. In Germany a child is a child, and in certain things, he not being educated, must be taught, and the great number of the so-called larrikins in this country is a consequence of their not being educated or directed in the right way. Many people say the right of the State against individuals is too much exercised in Germany, and instance, in support of what they say, the military education of the people. I can assure you, however, that this has a good effect, and that the men who have passed through the army are very different from the men who have not been placed under such restrictions. Even here, the State is allowed to put some restrictions on the people, such as the vaccination and quarantine regulations. I have heard nothing against these. Everybody seems to think they are very proper things, and so do I. But what about other things in which the English people prevent the liberty of the subject, such as Sunday closing? That this is quite right I do not say. But there must be restrictions in some cases, and I say the people have to be watched and have to be guarded by the State. It is the duty of the State to protect medical

men who have spent much time and money in studying for their profession against quacks and impostors who have not studied at all, or at most very little. I look upon these quacks as certainly the lowest class of men, but unfortunately for us they have their supporters among the highest classes. Why this support is given I do not understand, but its consequence is apparent to us all. In my short sojourn in these colonies I have myself seen things, and I am assured by others that much is done by these quacks which should not be allowed. A case came directly under my notice which occurred in the town of Petersburg, situated at the junction of the Silvertown and Northern lines. It contains about one hundred houses, and has a population of only four or five hundred persons, and yet at the present time there are practising there four people. One of these is a legally-qualified practitioner (Dr. Stevenson), and the others are quacks—two male and one female. This female quack recently prescribed for an unfortunate patient, and sent her on to the other world. It happened in this way. A woman came into the shop of the female quack, who calls herself a chemist. She is, I may say, the wife of a late chemist, who kept a chemist's shop and small hospital. The unfortunate patient said she was in a bad state, that she was *enceinte*, that she did not want any more trouble, and that she wanted to do away with the child. The stranger had a fit, and to bring her out of the fit the quack got a bottle of ammonia, poured a good quantity into a cup, with about as much water, and gave it to the poor woman to drink. She swallowed it and showed the usual symptoms of ammonia poisoning; she began to foam blood at the mouth and pass blood by the bowels. This happened about one o'clock. I happened to be at Petersburg, and was called in at five o'clock. I told the quack that if anything happened that it was a case of ammonia poisoning, and that ammonia would be the cause of death. The poor woman died, and I was called in to make a post-mortem examination. I found all the symptoms of ammonia poisoning, and gave evidence of that at the inquest. The woman was committed for trial at the Gladstone sittings. The day before the sittings came on, however, I got a paper informing me that it had been decided not to prosecute the case further, and the affair consequently collapsed. I never found out why it did collapse, but I think it was because she, being a quack, had the sympathies of the population. Dr. Stirling, in his paper, said we should not be able to prevent chemists from giving soothing syrups for toothache or other such things, or from pulling out teeth. We all know, I think, how many children die every year from taking patent medicines, and I think more stringent measures should be taken with regard to their introduction. As we, in this colony, are going in for protection, I think a very heavy duty should be put on them. Public opinion has to be educated on these as on other subjects, and if the State does not show the public that a quack is a quack, and as such should be despised, the public will not always get that education. If these quacks are allowed to practice unchecked the Australian colonies will be overrun with them. No medical men of reputation will ever come here from the old country, and our medical schools will

lose their pupils and disciples because of these impostors. In Germany each doctor has to appear before a body of experts to prove his ability. The Minister of Education is also the Minister of Health; his department has different Government medical advisers, and every district has its district health officer and district surgeon. The district surgeon has to watch the midwives, and examine them every year to see that they are still competent in their knowledge. These women are very different from our class of midwives. I do not know any educated persons nursing in the country districts, but the women who have assisted at the births of 20 or 30 children get so confident in their own knowledge that they think they know everything better than any physician. If the Local Government Bill passes, provision should be made for a district officer, who should instruct the women in the various districts in this duty, in order to create a valuable class of midwives. I consider that if we are to protect ourselves against impostors in our profession, we should have the right to examine all medical men who come into the colony. I do not mean that they should be required to go through the whole course of examinations, but I think we should make any new arrival in the colony show his capabilities—either take him to the hospital or make him lecture, to show that he has been trained in medical science. We have so many people coming with bogus diplomas, or perhaps diplomas which might be stolen, that a man might appear to be qualified who knew nothing. I should think there are so many questions involved in this subject that a simple discussion can hardly finish it. I think a Committee should be appointed to find out some way of getting out of the difficulties in which the medical profession in Australia is placed.

Dr. ALTMANN (Tanunda)—I do not quite agree with Dr. Abramowski's proposals with regard to quacks, and I think it would be impossible to carry them out. I agree with Dr. Stirling that we should not overstep the mark, or people will resent having their liberty interfered with. No man, unless registered, should be allowed to sign a death certificate. I am surrounded by six quacks, residing within six miles of Angaston. One of these, a man, can hardly write his own name, but yet signs himself 'doctor.' That man at an inquest positively swore that he was an M.D., of Berlin, and when reminded that he was on oath, stuck to his statement. People of the more ignorant classes have said to me, "He puts doctor with his name, and he must be all right," so that a man has only to take the name and that will be sufficient.

Dr. MORIER (Mount Barker)—Under the present law no right is given to withdraw diplomas, and that is a point which should be changed. We have had two very particular examples in this colony where the Medical Board was unable to withdraw certificates they had granted. In one case the man went to New South Wales, where he established a practice, although no longer a licentiate of the College which granted him a diploma. To allow anyone to sign death certificates is no less than a standing joke. So far as Dr. Bickle's paper goes as regards medical men and clubs, it is a matter of particular interest to country practitioners. Referring to the ques-

tion of unqualified practitioners in this colony, it is all very well to say people will not allow their liberty to be interfered with, but we know that the army and navy are protected against quacks, and why should not the public be protected as well.

Dr. E. C. STIRLING (Adelaide)—I think that the views of those who have spoken have been fairly in agreement with the suggestions brought forward in my paper. The difficulty, and I knew it would be so, is how to arrange that any action of this Congress should aid in those directions in which we are absolutely agreed. I think, sir, you have already taken a stand in not admitting certificates unless signed by a duly qualified person. In this the difficulty is to overcome the supineness and inertness of the law in the matter. Our lawmakers are careless on this question, and as South Australian members know perfectly well, all representations made in the past have been absolutely futile. Last year the South Australian branch of the British Medical Association had some suggestions drawn up, and the President and some members of the Association interviewed the Attorney-General, who was Premier, on the subject. That gentleman admitted that everything we wanted was perfectly reasonable. It was suggested that a bill should be brought forward in Parliament, but it soon became evident that the Government had no intention of doing anything of the kind, the reason being obvious that such a course might estrange the sympathy of certain of their supporters. It is a very unfortunate thing that susceptibilities of this kind stifle many legitimate reforms. It is unnecessary to go into details with reference to New South Wales, where they are experiencing difficulties similar to those under which the profession in South Australia labour; and perhaps also in Victoria the whole course of medical legislation has not been so smooth and easy as it might have been. With regard to death certificates I am certain there can be no doubt that our opinion is right, and on that the meeting looks to hear something from yourself upon the subject, inasmuch as you hold an important position, not only here, but in your capacity as Registrar-General of deaths. Another matter also alluded to requires settlement, and it is one which there ought to be no difficulty in getting the Government to undertake. That is, that power should be given to the Medical Board to cancel or suspend those certificates which they have the power to issue. At present the position is absurd. Under existing laws we have had criminals in the profession whose names have been removed from the rolls of the corporations which granted their diplomas, but whose names yet remain on the register as legally qualified medical men in South Australia. The period of medical education necessary should be stated in the Medical Act. A certain extended time of education is necessary. We know that at the present moment there are in some countries institutions tolerated, which are legally entitled to issue qualifications, and which do issue qualifications after only one year's study by the student. It is on the face of it an absurdity that a short period like a year should be admitted as covering the necessary period of study. This Congress can do little more than express opinions, and so far as concerns South Australia what ought to be done is for the Medical Association to take the matter again in hand and once more endeavor to induce the

Government of the day to carry out the moderate and modest reforms which we ask for in this direction. I think that that will be the only thing we can do in South Australia. As regards the other colonies I gather that the members of the profession in Victoria are fairly well satisfied with the present position of affairs. In New South Wales they are busily engaged with this question, and Dr. Creed has been an active mover in the whole matter of unqualified practice. I find he agrees with me in being adverse to actual prohibition, and in favor of certain restrictions only; he also truly says the only way to lead the public is to show the public what these people really are. He has got together a good deal of evidence which shows the ignorance of those engaged in this abominable practice. The Legislature might well take a share in the enlightenment of the public in a question which so closely concerns its welfare.

Dr. JAMIESON (Victoria) said—Dr. Stirling said rightly that Victorian members of the profession were moderately satisfied with our medical legislation. We are distinctly in advance of these two colonies of South Australia and New South Wales. If the Parliament will only show up these quacks to the public properly we ask no more. It appears to me that the demands and requests in Dr. Stirling's paper are moderate, and that they have been to a great extent conceded in Victoria. It should be made penal for any man to give a wrong name and title, and thus obtain money by false pretences. It is punishable for a man in Victoria to have a wrong label on his door, but in most of the colonies it is not, though it ought to be made so. Our Medical Board has the power of insisting, and exercises that power, that no person may register who cannot produce evidence of having attended a regularly-graded course of study for at least three years. No one will say three years is too long. We think five not too long. In England and in European countries, as well as in these colonies, we ask students to pass five years study, and it is unfair to us that any man should be able to come from any other part of the world and practice when he has studied less than three years. About certificates of death, there is a difficulty in connection with places of scattered population in these colonies, and there must be a certain range allowed in such cases, but to definitely legalise certification of deaths by unqualified practitioners is a little too absurd. There is a new Bill just introduced in the Victorian Parliament amending the Health Act, and there is a provision in it for compulsory notification of the outbreak of certain diseases, which is very strict and offensive. Medical men are classed with policemen and others, and ordered to give notice of any outbreak. It must be clear, however, that we cannot carry out sundry necessary precautions in these cases until we have some kind of notification. It has not been found in England that it has caused any complaint between the medical man and the patient, and there is a great gain in prospect. It will only be by knowing the beginnings of an outbreak in any particular locality that it will be possible to take the preventive measures by which it can be kept within reasonable bounds, and while it is unfair that Victorian medical men should be compelled like public servants, under pains and penalties, to give notice of the presence of certain diseases, some kind of notification should be necessary.

The Hon. J. M. CREED (Sydney)—In New South Wales there is no law which in any way controls the practice of medicine. At the present time the evidence of unqualified practitioners is accepted, even in inquests. I know one particular case where a man was tried for murder, convicted, and sentenced to be hanged, and the sole medical evidence was that of an unqualified practitioner, who had never held any appointment, or had any training except for a time as dispenser at a hospital. The man was eventually reprieved, but is still in prison, although I and many others are confident that it was not a case of murder but a case of suicide. The entire evidence which could be of value was inference to be drawn from the number and position of the wounds on the body of the dead man. The inferences drawn by the unqualified man were wrong. This is not only my own opinion, but I have taken the case to many skilled surgeons, and I never found one but agreed that it was highly doubtful that murder had been committed, and that it was a case of suicide rather than murder. In New South Wales recent investigations show that there are 180 persons practicing medicine who have no qualifications, and probably of this number 170 have received no training whatever. Many of you may have read the evidence given by these persons before the Committee, of which I was chairman. It has roused attention all over Australia, and more particularly in New South Wales than elsewhere, and I think the result there will be an Act of Parliament which will remove some of the abuses. An influential deputation will wait upon the Government, and urge that it is the duty of the Government to introduce the measure. The people of the country, having been shown what they have been suffering from, should be protected by the Government, and what every practitioner should aim at is to have a Bill, the practical result of which would be to protect the public and himself. I think what is needed was put thoroughly by Dr. Jamieson. In the Legislative Council in New South Wales I stated that I considered the Medical Act should be on the same lines as the Adulteration Bill. I proposed 15 years since that no man should be allowed to assume a title which he did not possess. No man should be allowed to call himself a medical practitioner if he were unregistered, and all persons practising without qualifications should be obliged to prominently advertise the fact that they were unregistered. This would place before the public the fact that these quacks had not the sufficient qualifications which the law requires. This would meet the cases of those who have diplomas purchased from American institutions, which would not enable them to be registered, but who can call themselves doctors in New South Wales, where there is no necessity under the Registration Act for any certificate to be given at all. The Registrar-General is compelled to register deaths on very slight information. As a rule they ask for a medical certificate, and they take these certificates from sources of a most questionable character. To overcome the difficulty, and alter the present unsatisfactory system, I proposed that the whole of the members of the profession in New South Wales should never give another death certificate. There is no means to compel them to do so, and I suggest as a means to secure proper legislation that they decline to give a death

certificate. I have asked the Registrar-General whether he had any authority to demand a medical certificate from a doctor in the case of a patient's death, and he said "No." If that was the case some member of Parliament would ask the Government why they do not bring in an Act compelling doctors to give certificates. If that were done they would have to define who shall give certificates, and that is all that is wanted. Evidence given before the Select Committee showed that a man might be murdered and his murderer might obtain the documents necessary for the burial of the body, and there is no law to compel the registration of the death till 30 days after it occurred. What possible check can there be if no registration of death is necessary till 30 days after it occurs? And so, a murderer can simply kill a man and bury him to put him out of the way without trouble. There is another phase of the question; under the New South Wales Act, there is no provision with regard to still-born children. There is no record made of the birth. The cemetery authorities, I hardly know why, demand, before burial, a certificate to say the child was still-born. Many hundreds of these were produced before the Select Committee, and some of them were the most curious documents I ever saw in my life. I had over 40 reproduced by photo-lithography. These documents are received by the cemetery authorities, though there is no legal necessity for them at all. As a result of the labours of the Committee, I have had a Bill drafted by which I propose to provide, in regard to death certificates, that no body shall be buried until it has been registered in the district where it occurs, and a permit for burial granted by the Registrar of the district; that no death shall be registered unless the person making the application hands in a certificate to the Registrar, either from a legally qualified medical practitioner, who has been in attendance upon the deceased person, or a certificate given by a police officer in charge of the district at the time the application is made, certifying that, having made due inquiries, he has no reason to suspect that death arose from any other than natural causes. The Act provides, too, that when a burial has taken place it shall be reported not only, as it is now imperfectly done by the undertaker, but also by the person in charge of the cemetery when the interment takes place. In that way we shall remove many risks of foul play which are created at present. With regard to still-born children, I propose that every still-birth shall be registered, as that of a still-born child in a separate register, and that on the registration of a still-born child the Registrar shall give a certificate for burial. With regard to reporting infectious diseases, Dr. Jamieson is right in protesting against the piece of gross discourtesy contained in the provision in the Victorian Bill, that members of the profession should be classed amongst those who shall report infectious diseases. There may be men who would be over-persuaded by an influential patient to conceal the existence of an infectious disease, but that is not likely to happen often.

Dr. JAMIESON (Victoria)—The provision in the Victorian Bill is that in a district proclaimed a district in which an infectious disease is present in a malignant form, it shall be the duty of every medical man to report the existence of the disease in any house. The only

point of objection is that if a medical man fails to give notification he shall be subject to penalties unless he can prove he was not sure of the existence of the disease. We must, I agree, have compulsory notification, but I think we should not be threatened in this way.

Dr. WHITTELL—With regard to that unfortunate little expression found in all printed death certificates, "Qualification (if any)," in our Registration of Births, Deaths, and Marriages Act, it dates from a long time back. The Act is to a great extent a copy of the English Act. I remember when I was in England practising, 40 years ago, we had precisely the same words. They have been copied by South Australian people, perhaps because we are fond of copying things from the old country. With regard to the reception of certificates of death from unqualified people, I may say that when the Government found it necessary to combine the offices of Registrar-General and the Presidentship of the Board of Health, one of the first duties I undertook was to ascertain the exact practice with regard to the reception of certificates of unqualified practitioners. My predecessor told me that for years past it had not been the practice to make any use of certificates so sent in—he, in fact, received them and entered the death as an uncertified death. It was not long before I found that, more particularly in the country districts, it had become a practice for all sorts of persons to give medical certificates of death, and that it was the practice of Deputy-Registrars to receive these. I had a consultation with the law officer of the Crown, placing the whole facts before him, and the Act under which it is required that a medical practitioner shall give a certificate of the cause of death when he has been in attendance on the deceased. I was advised that the words "Medical Practitioner" mean a legally-qualified medical practitioner. Having received these instructions I felt it necessary to communicate with the deputies, instructing that no unqualified practitioners' certificate should be received. That practice has been continued to the present time. There is a single exception in which the Government differed a little from the Medical Board here as to the qualifications of one gentleman, and the result is that one gentleman is allowed to send in certificates of the cause of death who is not on the authorised list of medical practitioners.

Dr. BICKLE—Would it not be a good thing if we could arrange that Medical Acts should be uniform through all the colonies? There should be no difficulty in securing this result. The question of health has the same bearing on all, and each one should see that it would be well if the Governments could bring in an Act which would be uniform in its clauses.

The Hon. J. M. CREED (Sydney)—I would remind Dr. Bickle that we all have legislatures, each containing two Houses, and I fancy it is rather Utopian to think we can get them all to agree to exactly the same measure.

Dr. E. C. STIRLING (Adelaide)—Some words which fell from Dr. Whittell lead me to make another remark. I referred you before to the difficulties we have in dealing with the Government in such matters. Here is an instance. The Government appoint a Medical Board for the express purpose of determining what persons are to

considered under the Medical Acts as duly qualified medical men; and of issuing registration certificates to these to practise as such. The Medical Board having been unable to admit the claims for registration in a particular instance, we are now told that the Government has instructed its principal medical officer to receive the death certificates of the gentleman in question as those of a duly qualified medical man, notwithstanding the refusal of its own appointed Medical Board to recognise him as one. That is the kind of difficulty we have to contend against here, and it is tempting to apply strong language to such an irritating and inconsistent method of procedure. Whatever may be the reasons, it is hard to get the Government to look upon these matters in a proper way.

GOVERNMENT RESPONSIBILITIES IN REGARD TO SIGHT-TESTING FOR LAND AND SEA SERVICE.

[By JAMES T. RUDALL, F.R.C.S.]

The subject on which I am about to address you is one so intimately concerned in anything like a thorough endeavour to ensure safety to human life in travelling that it can well supply material for consideration on the first occasion of an Intercolonial Medical Congress. Permit me to remind you that defects of sight, including colour-blindness, in relation with land and sea signalling, received attention at the International Medical Congress held in London, in 1881, so much indeed that the Congress adopted a series of "resolutions as to tests of sight suitable to be enforced in the case of signalers and look-out men and other persons by land or sea." Had these "tests" been thenceforth established by law, there can be no doubt that ere now many lives would have been saved, but unfortunately there is still apathy on the one hand, and prejudice on the other, displayed by many of those whose duty it is to give serious attention to every reasonable and practicable suggestion for the safety of life. The aim of the following remarks is not to demonstrate the technical methods of testing sight, nor even to define the standards which ought to be maintained, but to point out that it is a proper function of the legislature to establish definite standards, and to insist on the employment of thoroughly qualified persons both to conduct the examinations, and to certify whether or not those standards are reached by each candidate. In former years there seemed to be a tacit assumption that every one possessed good sight—at least if the contrary were not at once obvious; but in the present day we know

that there is a considerable proportion of people with visual defects, which in many instances can be discovered only by a stringent examination. By those occupied in the treatment of eye affections a certain standard for acuity of vision was long ago agreed on, and generally accepted. It is well known among oculists of all nations it has proved of the greatest value, and is indeed practically indispensable. Though the acuity of sight of savage races has often been commented on by travellers, it is only within a few years that any ophthalmologist has been able to furnish results of examinations of sight in uncivilised or semi-civilised men. Professor Cohn, of Breslau, states that on testing some Nubians he found it nothing extraordinary for a Nubian to have twice the normal acuteness of vision. Kotelmann and Stein obtained the same results for the eyes of Laplanders and Patagonians. There is abundant evidence that the habits of life among civilised races are more and more causing defects of sight, and I believe we are fast approaching the time when it will be found necessary systematically to adopt hygienic precautions against the deterioration of sight.

Dr. W. A. Brailey, a very careful observer, estimates errors of refraction sufficient to cause marked impairment of sight at not less than eight per cent. in England, and it must be remembered that besides errors of refraction, there are numerous other causes which have a similar influence. No wonder, therefore, that not a few of the Boards and Corporations of railways, steamship lines, &c., have been forced to do something in the way of instituting examinations of sight; that in too many instances they have stopped short of taking measures of real efficiency, evidence is now and then supplied, sometimes by their own confident assertions, which give condemnatory proof, sometimes by a chance examination of men who have passed their tests, and have subsequently been found deficient.

What conclusion must we come to when we are told that "the medical test for colour blindness works so well that not ten, or perhaps five, per thousand are rejected," and that "candidates for appointments who are affected with only difficult or blunted perception of colours are allowed a month or two to educate themselves?" It has never been shown that a person with congenital defect in perception of colour can by any means rectify or reduce such defect. Cohn says of colour blindness:—"This defect is as little curable by training or practice as is the lack of an eye." Yet there is no doubt that, as pointed out by Holmgren and others, the colour-blind may come to distinguish between red, green, and white lanterns or flags, and even call them by their right names, whilst all the time it is not colour which he sees; he only differentiates by the degree of inten-

sity of light. As a signal observer, therefore, his perception is only relative, and not absolute—one of degree, not of kind; and it is about as dangerous to allow such a person to look out on steamships or railways as it would be to employ for normal-sighted persons, not different colours, but the same one colour in different degrees of saturation; for example, to let a pale red, indicate safety, and a deeper red, danger. Would any one in his senses allow such a system; and is it not clear that testing of colour perception ought to be specially directed against the possibility of the candidate differentiating by the degree of intensity of light? One can understand that a month of training may in this way give a candidate with defective colour sense an opportunity of passing some tests in the examiners' room, but it will not give him equal help in suddenly recognising the defective colour in a misty atmosphere. Even if candidates and departments find this kind of examination satisfactory, it ought to be speedily put a stop to by the legislature in the interests of public safety, as well as in the interests of the candidates themselves.

In the fatal railway collision which happened at Windsor, Victoria, in May last—whether or not it in any degree depended on defect of sight—the vast importance of good sight for engine-drivers and firemen was demonstrated. That collision occurred through an express train running into a stationary train, and it naturally suggests the question, why was not the tail light of the stopped train perceived in time for the express to pull up? There is a curve nearly all the way from Prahran to Windsor, but as far as one can judge by passing over the line in the train, there is scarcely a spot where the view ahead would be less than 70 or 80 yards. There is some conflict of testimony whether the brakes were put on before the collision, though it appears probable that they were; but as the driver and fireman of the express train each died bravely at his post, we have no evidence as to the state of their sight, unless the railway department should ever find itself able to supply it. Not long ago the Editor of the *Boston (U.S.A.) Transcript* wrote as follows:—“Railroad employés, far more than the occasional traveller, need an effective colour-blind law for their own protection. An instructive case happened lately in Indiana. A locomotive ran past a danger signal while the fireman was on the look-out. A collision followed, and the engineer was injured to such an extent that amputation of both legs became necessary. The fireman was found to be colour-blind. A suit against the Company was threatened, on the ground that, even at common law, they were liable for their negligence in employing a colour-blind fireman, and they settled the case by paying

the engineer 10,000 dols. A good law such as that just passed in Alabama would, if properly enforced, have saved the engineer his legs and the Company its money." In the same paper it is stated that many accidents, really caused by colour-blindness, are set down to carelessness or intoxication. In the case of the collision between the tugboat *Lumberman* and the steamship *Isaac Bell*, resulting in the loss of ten lives, a coroner's inquest was held without definite result, the general impression being that one or other of the pilots was intoxicated. There was, however, no proof of this. About three years afterwards the pilot of the *Lumberman* was examined by the surgeon of the Marine Hospital service, and was found to be colour-blind.

The arguments for State interference in this matter must be summarised. In the first place the traveller has no means of protecting himself. Very often he has no choice of route, and, whether he travels by land or by sea, no proof of perfect sight of those in whose charge his life is for the time placed, is publicly afforded. From the time he steps on board of a steamer or into a railway train, his safety of life and limb depends in large measure on the vigilance and competency of the officers and employés, and remotely, though perhaps not less essentially, on regulations made by the departments, which regulations should be controlled by the law of the land. I maintain that when Government legislates against food adulteration, against the introduction and spread of infectious disease, and in other ways endeavours to provide for the public health and safety, it cannot reasonably disclaim responsibility in this matter. It does not often happen that we are compelled to depend on one particular baker, or butcher, or grocer, if we are not satisfied with his wares, but it occurs not unfrequently that we are obliged to travel on one railway line or in one train or steamship without any choice at all. Adequate provision for safety is therefore on this ground more necessary in the latter than in the former instances. Time would fail if these arguments were carried out to their full length. In every large community there are numbers of persons in several occupations whose sight must be good in order for them not to be unsafe to others as well as to themselves by reason of the nature of their calling. Soldiers, sailors, policemen, locomotive engine drivers, and many others, should be subjected to an examination of their sight, and it is clearly desirable that such examinations should be made as nearly complete and uniform as possible, and it is practically impossible to ensure completeness and uniformity without legislation. But there may be legislation which, at first sight satisfactory, is in reality useless. Not only must the standard of sight

be definite, but the examinations must be carried out by technically educated examiners. The belief still lurks about that if a candidate reads the distant test types fairly, and matches Holmgren's wools, he is competent for any duties, in the matter of sight. I have seen instances of persons with partial detachment of the retina, and with posterior polar cataract, who, showing no external sign of disease, would have stood a good chance of passing some of the examinations. Such instances, however, form a small contingent when compared with the much greater number who, suffering from an error of refraction, have their colour sense diminished in much larger degree than their sense for form. Many of these persons would readily pass the tests referred to above, some who did so have come subsequently under my own notice. Ophthalmic practitioners not infrequently find patients sent to them for supposed short sight to be really suffering from exactly the contrary condition—hyperopia—with or without spasm of accommodation, and the latter condition may even be induced in eyes with little or no error of refraction, by excessive and incautious use of the eyes. The fact that error of refraction may diminish the distant perception for colour, much more than for form, has not been generally recognised, but I have repeatedly seen marked examples of it. This shows how fallacious, in a practical sense, must be all testing of colour sense with objects only a foot or two from the eye.

The Act passed by the General Assembly of Alabama “for the protection of the travelling public against accidents caused by color blindness and defective vision,” and which came into operation on the first day of June last, may well serve as a model. That the passing of this Act is in great measure due to the energetic and persistent efforts of Dr. Joy Jeffries I can have no doubt. By it no person can be employed as engineer, fireman, or brakeman who does not possess a certificate of having healthy eyes and eyelids, unobstructed field of vision, normal visual acuteness and refraction, freedom from color blindness, and absence of cataract. For second-class employes the demands are somewhat less stringent, but no one can be promoted from the second into the first-class without the certificate demanded in the last-named one. Re-examinations have to be made every five years, and not only that, but also after any serious disease of the eyes, after all injuries affecting the head or eyes, after any disease of the brain, after every long-continued illness, as typhoid fever, after mistakes or acts which call in question the visual powers either of form or color, and whenever a majority of the Board may deem it necessary and so direct. It is made the duty of the State Board of Health to supervise the

administration of this law. Up to 1881, when I was last in Europe, there were still but few countries in which adequate regulations as regards the details of the examinations, and the qualifications of the examiners, were in operation. It is satisfactory to know that now efficient enactments have become more nearly general. In order to ensure the public safety, it is in these colonies absolutely necessary to have legislative enactments to overcome the apathy and obstructiveness too often displayed. There is really no difficulty in introducing an efficient and reliable system in place of the present absence of system. Instead of allowing railway, steamship authorities, and the like, to do or leave undone at their will, an Act should be passed insisting on every candidate for office, in which numbers of other lives depend on his sight, being tested by a thoroughly competent examiner, and if his sharpness of sight for form and for color, his refraction, field of vision, and freedom from eye disease do not attain the standard, which must be imposed by law, forbidding his employment.

It is highly desirable that there should be an agreement among the colonies as to standards of sight to be adopted. Even if the amount of work in testing became very great, I doubt not that there can be found in each of the capital cities a sufficient number of qualified medical specialists to do it efficiently. There should be in each capital a central office with the means and appliances required, a staff of qualified examiners, and one or more clerks. Notes of every candidate examined should be taken down at the time, and a permanent record kept. Nor need the cost of such an establishment be excessive; indeed I have no doubt that it would practically be self-supporting. The money cost of a railway or steamship disaster might easily amount to a larger sum than would cover the total expenses of such an establishment for a score of years. It would seem, however, that prevention of accidents does not commend itself to the minds of some persons so much as prevention of successful claims being made for high sums of money as damages. Two suggestions have lately been put forward in this connection. One is that as all travellers pay alike, the loss of life or injury to health should also be paid for according to one scale, irrespective of any valuation as to amount of earnings, &c., in each case; and further, that in no instance should the amount payable as damages exceed the sum of £300. The obvious iniquity of this proposal, and its barefaced repudiation of liability, are, I should think, enough to render any discussion of it unnecessary. Another new proposal is, that every railway traveller should be obliged to take an insurance ticket for each journey. Let railway companies, or, as in our case,

the State, protect themselves by a system of insurance ; but certainly it is neither equitable nor expedient to make any such insurance system a further encumbrance to the traveller. It would be absurd to say that when he pays to be moved from one place to another safety is not included in the contract.

That before long the State will find its own interest in insisting upon an examination of the sight of all candidates for employment in the clerical branches of the civil service is quite certain, just as already several of the large incorporated bodies employing hundreds of clerks have for some time past found it desirable. Here, however, public safety is not involved, the matter being little more than one of financial relations and liabilities between employer and employed. It is also evident that the standards in this case should be to some extent in relation to the kind of work required.

A very few words in brief recapitulation and explanation of the more important points of this paper :—

1. It is the duty of Government to pass laws which cannot be evaded, to ensure the public safety in travelling.

2. This duty is the more imperative, as travellers are by the nature of the case precluded from taking steps to protect themselves.

3. No law will be effective which does not provide for a definite standard of sight to be maintained, and for the examination being made by technically competent examiners.

4. It is desirable that in each capital city an office with the requisite material, with a staff of trained examiners and one or more clerks, should be established by the respective Governments.

5. A permanent and always accessible record of the sight of every candidate passed should be kept in this office, and likewise a record of the cause of rejection of every candidate not passed.

6. In the event of any candidate being obliged to be examined at a distance from the capital the examination must be conducted according to a definite scheme and a regular schedule setting forth the sharpness of sight for form and colour, the refraction, &c., filled in by the examiner who must be qualified for the duty.

7. On the first opportunity the candidate must be passed through the central office.

8. One office and staff would serve for the examination of sight for all railway and marine signalmen, locomotive engine-drivers, pilots, soldiers, sailors, and policemen.

9. To the head or to the whole professional staff the Government might submit many questions of injury to sight, &c., on which it desired information.

CHILDBIRTH MORTALITY IN AUSTRALIAN COLONIES.

[By J. JAMIESON, M.D., Melbourne.]

The question of the high rate of mortality among childbearing women in these colonies, especially as regards Victoria, is one to which I have repeatedly directed attention. I may be allowed to refer to papers, on different aspects of the question, in the *Australian Medical Journal* for January, 1879, and the *Australasian Medical Gazette* for July, 1882. In both of these communications my special endeavour was to arrive at some conclusion as to the prevalence and causation of puerperal fever, and a large amount of statistical data was collected as a help toward that end, though much of it was general enough to admit of use for other purposes.

In the paper which I have now the honour to bring before you there will be no attempt to discuss obscure questions in pathology. My object is the less ambitious, but perhaps not less useful one, of seeking to discover in how far, judging by results, we have profited by the improvements introduced of late years into the practice of obstetrics, and to make such practical suggestions as may seem necessary. It was my original intention to take my materials from the mortality returns of the chief cities, but on further consideration it seemed better to extend the field of observation to the various colonies as a whole. Even then the data will be none too large for purposes of safe comparison. For the same reason I have not considered it necessary to divide the returns of deaths into those from puerperal fever, or "metria," and those from all other causes directly connected with childbirth. Even if the data had been more extensive, it is unfortunately the case that the registration returns are not always to be relied on for distinguishing these two classes of cases. And further, it is to some extent doubtful whether the returns of death, from all causes directly connected with childbearing, can always be depended on. Unless very careful scrutiny is made errors creep in, allowing of deaths being included under other headings, which ought properly to be ascribed to childbirth causes, with the result that the mortality from these latter, as shown in the returns, is put lower than it actually is. And further, it is doubtful whether the precautions taken to secure accuracy are the same in all the colonies, and unless this is the case any comparison of one with the other may be of comparatively little value. I do not propose, therefore, to make any such comparison as that last mentioned, but rather to take the figures for the chief colonies as a whole, so as to get a basis of comparison, large enough to be safe and free from local peculiarities or defects. With the help of the

figures thus obtained, I propose to compare the childbirth mortality in these colonies, at periods sufficiently far apart, for the purpose of discovering whether there has actually been any such improvement in the mortality among lying-in women as might have been fairly expected, in view of the improvements in doctrine and practice which have of late years been introduced. I propose to follow this up by a similar comparison of the mortality returns in England, also at periods equally far apart, in order to discover how we stand in regard to this important question when contrasted with the mother country.

Before making the comparisons proposed, it may be interesting to present a table showing the numbers of births, and of the deaths from metria and "accidents of childbirth," separately and in combination, in Victoria for a series of years, with the view of showing the great fluctuations in the mortality, from year to year, both in the totals and in that from each class. I select Victoria for the purpose, not only because I am most familiar with the figures referring to it, but because I believe the system of registration to be more perfect than in any of the other colonies.

TABLE I.—Showing the number of births and of deaths from metria and childbirth in Victoria, 1871-85.

Year.	Births.	Metria.	Childbirth.	Total.
1871	27,382	12	90	102
1872	27,361	16	123	139
1873	28,100	44	127	171
1874	26,800	109	142	251
1875	26,720	83	154	237
1876	26,769	48	117	165
1877	26,010	42	131	173
1878	26,581	49	149	198
1879	26,839	38	123	161
1880	26,148	20	111	131
1881	27,145	78	155	233
1882	26,747	59	117	176
1883	27,541	43	115	158
1884	28,850	72	131	203
1885	29,975	62	106	168

The fact that there have been such fluctuations in the mortality, with a birth-rate varying little through a series of years, is sufficient to show the necessity for obtaining tolerably large and comprehensive data before attempting to come to any conclusions. I have therefore collected, with the view of comparison, the figures for two

periods of five years each, including the births and the deaths from causes connected with child-bearing, registered in Queensland, South Australia, and Victoria. I have been unable to include the figures for New South Wales, because I could not obtain published returns earlier than 1875, or later than 1884. Not being able to give the figures for the whole of the years in each period, it seemed advisable to leave them out altogether.

In the following tables are given the numbers of births, and of the deaths from all child-bearing causes, in the colonies first mentioned, for the periods 1871-75 and 1881-85.

TABLE II.—Showing the births and deaths in 1871-75.

	Births.	Deaths.	Rate per 1,000 Births.
Victoria ...	136,363	900	6·60
South Australia	36,389	166	4·56
Queensland ...	29,279	147	5·02
	<hr/> 202,040	<hr/> 1,213	<hr/> 6·0

TABLE III.—Showing the same for 1881-85.

	Births.	Deaths.	Rate per 1,000 Births
Victoria ...	140,258	938	6·69
South Australia	56,618	284	5·02
Queensland ...	48,979	297	6·06
	<hr/> 245,855	<hr/> 1,519	<hr/> 6·18

From these figures, which probably are large enough, and extend over long enough periods to permit of fair comparison, it appears that, in the colonies referred to, not only is the mortality among child-bearing women high, but also that it was slightly greater in the more recent period. Though I have left New South Wales out in making the calculations, it may be right to state that in the four years 1881-84, the death-rate was only 3·92 per thousand. I venture to think, however, that such a marked difference from the condition found in the other colonies is best explained by some imperfection in the registration system, though where the fallacy comes in I do not venture to say.

Having thus discovered, as exactly as possible, the rate of mortality among childbearing women in the Australian colonies, it is necessary next to compare the condition so found with that of England. Taking the same periods, I find, from the data supplied in the annual reports of the English Registrar-General, that the rate of mortality from all childbirth causes, per 1,000 births, was 5·49 in the period 1871-75, and 4·94 in the period 1881-85

Not only, therefore, is the average mortality lower in England

than in these colonies, but there is also a distinct improvement in the rate in the second period. It should be borne in mind also that in 1881 a system of special inquiry into the true cause of death, occurring in women after delivery, was instituted in England, with the immediate effect of bringing up the rate, in 1881-85, to as much as one per 1,000, when compared with the years 1877-80. While, therefore, the rate for 1881-85, as given above, may be taken as approximately correct, that for 1871-75 is certainly considerably under the correct figure. The effect of this of course is to make the reduction in the death rate, which occurred between these periods, much greater than is shown by the figures.

There may have been in all the colonies, as there certainly has been in Victoria, an increase of accuracy in these returns of late years; but the general fact may be taken as established, that not only is the death-rate lower in England than in Australia, but that it is tending downwards there, while there are no indications of any such tendency here.

It may safely be asserted that a high rate of mortality among lying-in women always indicates an insufficient average measure of care or skill on the part of those who have the management of cases of labour. The English Registrar-General showed this long ago, by comparing the low rate of that mortality in London, where even the poorest women can obtain skilled attendance, with the high rate in North Wales and similar districts, where labour cases are chiefly conducted by ignorant old women. It is possible, however, to go a step further, and insist that a high death-rate following delivery is specially due to want of care in guarding against infection at or soon after delivery. This is tantamount to saying that any such persistently high rate of mortality is specially owing to the prevalence of puerperal fever, that again being due to neglect of those antiseptic precautions, whose value has been established by the saving of life which has followed their careful adoption in most of the lying-in hospitals of Europe. That puerperal fever has a large share in producing the high rate of mortality in Victoria is shown by the figures given in Table I., and it is beyond doubt that the deaths assigned to that cause are to a considerable extent below the actual number. If anything in the field of practical medicine can be taken as proved, it is that puerperal fever is a preventible disease; and the means of prevention at our disposal are both more reliable and more easily accessible than in the case of almost any other of the infectious diseases. But if this be so, it is plain how heavy must be the reproach resting upon us, if our utmost endeavours are not used to lessen its prevalence, and in proportion to lower the death-rate among lying-

in women as a whole. This can be done in part by the careful management of each case in all its details, but particularly by the scrupulous carrying out of those precautions against the possibility of conveying infection, which have now been clearly formulated. But, unfortunately, it is not sufficient that medical men should exercise every care in the cases under their own charge. Very many women are attended by midwives or nurses, often possessed of little or no training or knowledge; and so long as this goes on it is vain to expect a large measure of improvement in the mortality among women after delivery. That careful training and constant supervision of the work of midwives may be depended on to produce good effects has been shown in the Duchy of Baden, where, as in most German countries, much of the work of attending women in labour falls to them. As the result of this training and supervision, and the obligatory use of antiseptic precautions prescribed by the authorities, the number of deaths in Baden fell from 530 in 1875, to 415 in 1880, to 380 in 1881, and to only 225 in 1882. What has been accomplished there could be done elsewhere, surely even in Australia. But even the universal adoption of such antiseptic and other precautions by medical men will not avail, unless something is done to secure that midwives and nurses, who attend such a large proportion of all cases, are compelled to submit to registration, with adequate training, and certification of competence as a preliminary. It may be impossible to prevent some measure of irregular practice, even after the adoption of a system of compulsory registration; but at least the standard of qualification would quickly be raised, and the public would be in a position to judge between the qualified and the unqualified. If, by the adoption of the measures here proposed, the mortality among lying-in women could be reduced by one-third—no very extravagant expectation—there would be an annual saving in Australia of seven or eight hundred lives, and these lives of the very highest value. I venture to suggest that this Congress would do well to pass a resolution, recommending to the Governments of the various colonies the adoption of legislative measures for the compulsory registration of women practising as midwives, and for the formation of Boards of Examiners, with power to give certificates qualifying for registration. Unless these steps are taken I can see no prospect of any great or early improvement in the death-rate after delivery, which is now so high as to be a discredit, if not a disgrace, to our Australian civilization.

THE THERMAL SPRINGS DISTRICT OF NEW ZEALAND AND THE GOVERNMENT SANATORIUM AT ROTORUA.

[ALFRED GINDERS, M.D., &c., Medical Superintendent.]

That mineral waters and thermal springs were used as remedies for disease in prehistoric times there can be little doubt. It is from the Greeks we get the earliest records of their systematic use. Greece is singularly rich in thermal springs. They are spoken of by Aristotle, three centuries before the Christian era, as being sacred to Hercules, who is supposed to have given them their therapeutic power by bathing in them. On certain ancient coins found in Sicily he is represented standing in a tub, with his chest exposed to a jet of water issuing from a lion's mouth; so that we may assume Hercules to have been the originator of the douche.

In close proximity to the thermal springs of Greece were built the temples sacred to Æsculapius. Many and marvellous are the stories told by ancient writers of the extraordinary effects of these mineral waters. One spring made those who drank of it stupid; another made them clever. One excited and another annihilated sexual power. One caused the teeth to fall out, one was a specific for hydrophobia, and another caused insanity. But most wonderful and most to be desired of all was a spring in Arcadia which made the odour of wine insupportable to those who once tasted its water. Such a spring must have been a superfluity to the simple-minded Arcadians, but what a boon it would have been to our modern intemperate advocates of temperance!

After all these remarkable stories it is rather depressing to be told by a modern Athenian chemist that the chief ingredient of the Grecian springs is common salt.

Hippocrates—unlike his modern brethren of the German Spas—seems rather to discredit these extraordinary stories of the effects of the mineral springs, and speaks somewhat disparagingly of them. Some of his quaint utterances are worth quoting. He says—"The saline, hard and drying-up waters, are, generally speaking, unwholesome. Springs flowing from rocks are indigestible. Such thermal waters as contain iron, copper, silver, gold, sulphur, alumina, asphalt, or nitre, heat the system, dry up the juices, do not pass easily out of the body, and cause constipation." In this, I think, we must agree with Hippocrates, as even in the present day we find that the absorption of the precious metals tends to "*dry up the juices*," notably the milk of human kindness. He further says—"Those who assert that saline mineral waters readily pass off with the fæces, or even excite the action of the bowels, speak in ignor-

ance, for the waters mentioned have just the contrary effect." It is clear Hippocrates never visited Carlsbad or indulged in a glass of Friedrichshall before breakfast. What a contrast his writing presents to the rhapsodies sometimes indulged in by modern German Spa physicians! Take the following example. Dr. Fenner, of Schwalbach, speaking of the waters of Schlangenbad, remarks—"You emerge from these waters rejuvenated, like the Phœnix; here youth becomes more beautiful and more brilliant, and age finds new vigour." This choice *morceau* leads one to suspect that Greece may not be singular in possessing a spring that causes insanity.

The account I have to give you of the thermal springs district of New Zealand will be a plain unvarnished statement of facts, without any attempt at special pleading or exaggeration, for although this wonderful district has afforded, and will continue to afford, to both poet and painter ample material for the exercise of their respective arts, the interest of the practical physician will be centred I presume in the inducements we are able to hold out when we invite him to assist us in making this district what it is certainly destined to become, namely, one of the most famous health resorts in the world. He will want to know the character of our climate, the constitution of our thermal springs, their therapeutic power, the class of cases likely to derive benefit from them, the accommodation we are able to offer invalids, and the result of our experience in the treatment of disease. It is the object of this paper to answer these questions, but before doing so I think it will be useful to take a hasty survey of the present state of scientific opinion as to the physiological action of thermo-mineral baths.

In quite recent times the most absurd theories have been promulgated on the following points:—(1) The nature of thermal waters *per se*; (2) the nature and cause of thermal heat; (3) the absorption of water by the skin; and (4) the permeability of the skin by the saline constituents of such waters.

It has been gravely asserted that the well-known chemical formula for water, H_2O , does not represent the water of thermal springs, that the waters of Gastein, in Austria, at least consists of three parts of hydrogen to one of oxygen. It was this chemically indifferent water of Gastein, which contains only two and a half grains of solid matter to the pint, that gave rise to the theory that thermal heat must have a character of its own essentially different to that of ordinary heat, as there was no other way of accounting for its remarkable curative properties. One fact adduced in support of the theory was that Gastein water did not burn the mouth and tongue to the same degree as ordinary water heated to the same

temperature. Our experience at Rotorua is the very opposite. We find that burns produced by our springs are much more severe and intractable than those produced by ordinary hot water, due, most likely, to the nature of the constituents in solution and suspension.

Again, it has been both asserted and denied that water is absorbed by the skin. The same doubt has existed with regard to the absorption by the skin of solids dissolved in the water. Now, if it can be shown that thermal heat differs in no way from ordinary heat, that the water of thermal springs *per se* is identical with ordinary water, and that the skin absorbs neither water nor the salts it may contain in solution, the question may well be asked, How do you account for your cures?

Well, although medicine is not an exact science like mathematics, and although we are compelled at times, in the interests of our patients, to act empirically, we are desirous, I believe, of knowing as much as we can possibly get to know of the nature and action of our remedies; and thermo-mineral baths should be no exception to the rule. The accepted facts with regard to this method of treatment are as follows:—The water of thermal springs is chemically identical with ordinary water. It was originally meteoric water, which, finding its way to varying depths in the earth's crust, is enabled by the aid of heat, pressure, and certain gases—notably carbonic acid—to dissolve out of the rocks with which it comes in contact the materials we find in it, transforming them in many instances, as, for example, when that grand solvent, carbonic acid, aided by heat and pressure, converts the silicates of the alkalies into carbonates. There is no satisfactory proof whatever that thermal heat differs from ordinary heat. Touching its source and origin there are numerous theories. The subject is interesting, and one feels inclined to dwell upon it, but to medical men it has no practical value. Suffice it to say that the theory which attributes thermal heat to the inherent high temperature of the interior of the earth appears to cover more ground, and is to me more generally satisfactory than the chemical theory. I therefore adopt it.

It appears probable that the skin is to some extent capable of absorbing water. The shipwrecked sailor is supposed to find relief to his thirst by bathing or saturating his shirt in the salt water. If this is true, it forms a pretty strong argument against the absorption of the salt.

Dr. Lauder Brunton in speaking of the absorption by the skin of substances applied to it in aqueous solution, remarks:—"Experiments on this point have usually been made with potassium iodide, on account of the ease with which this salt can be detected in the

urine. The results have generally been negative, but sometimes they have been positive. The general result is that the salt is never absorbed by the skin from the solution, and that in the cases where absorption has taken place it has been due to the skin not having been washed after the bath, so that the iodide has crystallised on the surface, and has afterwards by friction of the clothes been rubbed into the sebaceous glands. It would appear that the fat in the skin as well as the epidermis presents an obstacle to the absorption of substances in solution; but when they are applied in such a form that they can readily mix with the sebaceous matter of the skin, they are readily absorbed."

We conclude, therefore, that the mineral constituents of our hot baths, if taken into the system at all, are absorbed in this way, and all the more readily, perhaps, from the vascular excitement occasioned by a high temperature, and the abundant free acid which many of our springs contain.

A patient emerging from one of our acid sulphur baths, having a temperature, say of 102° , looks like a boiled lobster, and I regard this determination of blood to the skin as a most important therapeutic factor. Such waters are rich in sulphates, notably sulphate of alumina, and have a highly stimulant action. The sulphur they contain is in a nascent condition, as I shall explain presently, and falls with the silica as the water cools. Our alkaline waters on the other hand, which contain the chlorides and silicates of the alkalies have a soothing effect on the skin, and are of great value in eczema, and other cutaneous ailments.

In this alternative stimulant or sedative action on the nervous and vascular apparatus of the skin, lies the whole secret of the therapeutic power of thermo-mineral baths. The effect of temperature, however, is important. If a patient takes a hot bath at bedtime, say of 110° to 115° , the probability is that he gets headache and feverishness, and is unable to sleep, whereas, if the temperature is below that of the body, say from 90 to 96° , the effect is soothing and soporific. Such a bath is felt to be agreeably warm from the fact that the water acts as a temporary check to the normal transpiration, evaporation, and consequent cooling.

Such, then, are some of the broader facts with regard to the physiological and therapeutic action of thermo-mineral baths. I need scarcely say that we do not attribute the cures, we are fortunate enough to make at Rotorua, exclusively to the use of hot water. We appreciate fully the influence of change of climate, scenery, occupation, regimen, and rest; not forgetting those most important

adjuncts to treatment, for which the patient must be mainly dependent on himself, namely, a mind at ease, and a spirit of hopefulness.

The geographical position of the North Island of New Zealand will naturally suggest something of the character of its inland climate at an elevation of 1,000 feet. Rotorua is some 50 miles from the coast. Its elevation is 990 feet above sea level; the atmosphere is drier and more bracing than that of the coast—in winter considerably colder, and in summer perhaps somewhat hotter; but a dry, pleasant heat, free from that moist oppressiveness which characterises the summer heat of Auckland and other coast towns. The mean temperature of spring is 53° , of summer 66° , of autumn 57° , and of winter 45° . The relative moisture of the air for the four seasons (taking complete saturation at 100°) is for spring, 74° ; for summer, 66° ; for autumn, 67° ; and for winter, 74° . The steam which rises so abundantly and perpetually all over the district no doubt adds considerably to the moisture of the atmosphere. This was clearly shown in the month of June last year when the great eruption of Tarawera took place. The relative moisture for that month was 10° in excess of the average owing to the immense amount of vapour caused by the eruption. The rainfall for the year is about 53 inches, and the number of days on which rain falls about 150. Auckland has 20 inches less rain and 15 more rainy days. The daily range of temperature is greatest in the summer and least in the winter. This condition maintains throughout the whole of New Zealand, and constitutes one of the greatest charms of its climate. No matter how hot a summer's day may be, the nights are invariably cool. The mean daily range of temperature for spring is 21° , for summer 28° , for autumn 23° , and for winter 20° . The most agreeable months of the year for an invalid to visit Rotorua are February, March, and April. The least agreeable are July, August, and September; but as there is ample boarding accommodation close to the baths, the invalid is virtually independent of the weather. Our climate therefore may be said to be mild, equable, and agreeable. By an equable climate I do not wish to imply one in which the same conditions prevail for long periods of the year, but rather one in which the different factors, temperature, moisture, light, electricity, wind, and atmospheric pressure are subject to moderate variations. Our patients, it must be remembered, are a mixed class, consisting chiefly of fairly vigorous individuals, in whom it is necessary to maintain the energy of different organs and functions, and the normal power of adaptation and resistance to climatic conditions. Such a climate we enjoy at Rotorua.

The thermal springs district of New Zealand comprises an area of upwards of 600,000 acres, or close on 1,000 square miles. The length

of the district is some 50 miles with an average breadth of 20 miles. Its altitude averages from 1,000 to 2,000 feet above sea level. The general physical features of this district are well described by Mr. Kerry Nicholls in a paper on the late volcanic eruption read by him before the Society of Arts in January this year. He says—"The general physical features of this region embrace extensive pumice plains intersected in various directions by high ranges of igneous formation, which are relieved here and there by enormous trachytic cones. Extensive forests of extraordinary luxuriance and beauty clothe the mountains and border the extensive plateaux, while hot lakes, boiling geysers, and thermal springs are dotted far and wide over the country." I beg to refer you to the January number of the Journal of the Society of Arts for the whole of this paper, which is most interesting, although I regret to see that his advocacy of the chemical theory of thermal heat failed to provoke discussion. The thermal springs district, however, as defined on the maps, by no means embraces the whole volcanic and hydro-thermal activity of the island. Although the volcanic slopes of Ruapehu and Tongariro bound this region on the south, hot springs are to be found here and there for fully 250 miles beyond its western boundary, in fact as far north as the Bay of Islands. Within the district it is no exaggeration to say that hundreds of hot springs exist, to say nothing of mud volcanoes, solfataras, and fumeroles. These springs are of the most varied chemical character, and of every degree of temperature from 60° to 212° . Not a twentieth part of them have as yet been submitted to analysis. Those which have been examined in the Laboratory of the Geological Survey Department in Wellington are divided by Sir James Victor into five classes:—1. *Saline*—containing chiefly chloride of sodium. 2. *Alkaline*—containing carbonates and bicarbonates of soda and potash. 3. *Alkaline-silicious*—containing much silicic acid, but changing rapidly on exposure to the atmosphere and becoming alkaline. 4. *Hepatic or sulphurous*—characterised by the presence of sulphuretted hydrogen and sulphurous acid; and 5. *Acidic waters*—containing an excess of sulphuric or hydrochloric acid or both. In addition to these we have saline waters containing iodine, cold acidulous chalybeates, and saline acidulous chalybeates. These, however, are in situations at present inaccessible to the invalid, or if not out of reach at least destitute of the conveniences and comforts essential to the sick, but no doubt destined in the near future to attain a high medical reputation. The Government of New Zealand has very wisely chosen the southern shore of Lake Rotorua as the basis of operations for opening up this wonderful district. Here are grouped together

numerous examples of the five classes of springs I have enumerated, and here the Government has fixed their first sanatorium and bathing establishment, to which it is my object specially to direct your attention.

The Sanatorium Reserve at Rotorua comprises an area of some 50 acres, bounded on the north and east by the lake, and on the west and south by the new township of Rotorua. Nine years ago this was a howling wilderness, covered with ti-tree scrub, diversified only by steam clouds rising from the various hot springs. Here the adventurous invalid of that day had to pitch his tent, and be satisfied with a hole in the ground for a bath; and if the spring he wished to use happened to be too hot for his purpose, he probably had to dig the hole for himself, and regulate the supply and temperature of the water to the best of his hydraulic ability. In many instances he immortalised himself by giving his name to the spring—names still retained. Thus we have "Cameron's Bath," "McHughes' Bath," "Mackenzies' Bath," and the "Priest's Bath." Other springs have received their names either from their appearance or from some real or imaginary quality—thus we have "Madame Rachel," "The Pain-killer," "The Coffee Pot," and "The Blue Bath." Why one spring, however, should be known as "Stonewall Jackson" is not quite so clear. Now this area of desolation is completely transformed. Walks and drives planted with evergreen trees traverse it from end to end, fountains and flower gardens delight the eye, and commodious buildings for the accommodation and convenience of invalids are springing up on every side. The principal of these are the Sanatorium Hospital, the medical residence, the Priest's Pavilion, the Rachel Pavilion, the Blue Swimming Bath (to which is attached the sulphur vapour bath and the electrical department), and Brent's Boarding-house.

The Hospital, which was opened in 1886, consists of a central building with two wings. In the centre are the consulting-room and dispensary, the dining hall and servants' offices. Each wing contains a sitting-room and six bedrooms, so that at present we accommodate twelve patients only. The stipulations made by the Government with regard to admission are—that the patient shall be able to show that his case is one likely to be benefited by the use of the baths, and that he is unable to pay the usual hotel or boarding-house charges. The Government charge for each patient is one pound per week. This, of course, does not pay expenses; but the object of the institution is to afford help to those who are unable to help themselves. A patient is allowed to remain three months, but if at the expiration of that time the medical officer is of opinion that a longer period is desirable, a second three months is granted; but in all

cases six months is the extreme limit. The greatest number of our cases are sent by the Charitable Aid Boards of the country, and the principal ailments we have to treat are rheumatic-gout, rheumatism, cutaneous diseases, and certain forms of paralysis.

I have made a series of observations on the effect of hot bathing on body weight. Every patient entering the hospital is weighed on his arrival, and again on his departure, and on looking through my case-book I find very few instances in which weight has been lost; in most cases the gain is considerable. This may be due to some extent perhaps to an improved dietary, but, I think, more to improved assimilation. On the other hand, plethoric patients of the better class, who board at the hotels and are willing to put themselves under rigid medical discipline, as universally lose weight, often to the extent of 14 lbs. in a month.

We have no spring in the district that has obtained a higher reputation, or proved itself more generally useful, than that known as the Priest's Bath. The character of the water is sulphurous, aluminous, and strongly acid. Its temperature varies from 98° to 106° . This variation is due to the rise and fall of the lake and the direction of the wind. When the lake is high and the wind blowing in the direction of the baths the conditions are favourable to a high temperature, and *vice versa*; the cold water of the lake affording a more efficient barrier to the escape of heat than the open pumice gravel of which the shore is composed. The solid constituents of the water amount to 96 grains per gallon, consisting of sulphates and silica. Of these the sulphates of alumina and soda are the most abundant. Sulphate of alumina, 21 grains; of soda, 19 grains; of lime, seven grains; of magnesia, three grains; of iron, one grain; silica, 18 grains; but the most important constituents are free sulphuric acid, 22 grains, and free hydrochloric acid, three grains, per gallon. The water is brilliantly clear when undisturbed and pale green in colour. A faint odour of sulphuretted hydrogen pervades the vicinity, which gas, together with sulphurous acid, is copiously evolved. Since the eruption of Tarawera this offensive odour has been much modified, owing, I believe, to an increased evolution of sulphurous acid. Fortunately for the nasal organs and general comfort of bathers, these gases effect a mutual decomposition, resulting in the formation of sulphur and water—thus, $2\text{H}_2\text{S} + \text{SO}_2 = 3\text{S} + 2\text{H}_2\text{O}$, which means that two parts of sulphuretted hydrogen combining with one of sulphurous acid form three parts of sulphur and two of water. If this water is allowed to cool a thin pellicle of sulphur forms on the surface, but as long as it is disturbed by the rising gases or by bathers it is precipitated, so that all surfaces over which the water flows are coated with a pale

yellow deposit consisting of sulphur and silica. Wherever steam charged with these two gases is able to penetrate, sulphur is deposited. This is the origin of all the sulphur in the district. It permeates readily the silicious sinter rock, forming beautiful needle-like crystals of sulphur in its interspaces.

Sulphur being thus constantly transformed from the gaseous to the solid state in the water of this spring, it is very possible that coming into contact with the skin in this nascent and impalpable form, its therapeutic power may be very considerably enhanced. The area in which this water is found is about an eighth of an acre in extent, a level sand flat on the margin of the lake. In any part of this area it is only necessary to dig a hole in order to make a permanent bath. The water is found a few inches from the surface. It was in such a hole as this that Father Mahoney, of Tauranga (now Vicar-General of the See of Auckland), some ten years ago found a cure for his chronic rheumatism, and gave origin to the name "Priest's Bath," by which the spring will always be known. On the site of this primitive arrangement stands our present Priest's Bathing Pavilion, a building 74 feet long by 44 wide, having a superficial area of 3,256 square feet. It is divided into male and female departments. Each department comprises two public *piscinæ*, 16 feet by 12, with comfortable dressing rooms attached, and seven private baths, one bath in each department being set apart for eutaneous uses. Each bath is provided with a cold fresh water shower, and by means of ingenious contrivances temperature can be regulated within certain limits. In each department, also, douches and showers, either hot or tepid, are provided, thus materially enhancing the hydropathic efficiency of this remarkable water. These works have been designed by and executed under the personal supervision of C. Malfroy, Esq., C.E., Government Inspector of Works. The skill and ingenuity displayed by this gentleman in the application of hydraulic ejectors to the raising and lowering of temperature, and the production of artificial drainage on a dead level, are beyond all praise. Adjoining this structure is the Rachel Bathing Pavilion. Here we have a water diametrically opposite in character to the last described—an alkaline silicious water—having a temperature at its source of 196°. This source is a cauldron of enormous depth, situated some 200 yards from the Bathing Pavilion, and yielding about 50,000 gallons daily. We have a simple system of cooling by which the water may be used at any desired temperature. Here also is a separate department for each sex, each containing public *piscinæ*, 16 feet square, four private baths, a waiting room, supplied with newspapers and periodicals, and dressing rooms. The solid con-

stituents of this water amount to 116 grains per gallon, and consist of sodium, potassium, and lithium chlorides, sulphate and carbonate of soda, silicates of soda, lime and magnesia, iron and aluminium oxides, and silica. Its reaction is alkaline, and it contains a small amount of sulphuretted hydrogen.

I frequently recommend the internal use of this water. Its taste is not unpleasant, and its action is mildly antilithic. Waters containing silicates are said to be useful in the uric acid diathesis, and certainly I have found it suit gouty patients admirably.

The Blue Bath is a warm swimming bath 62 feet long by 24 wide. It is built of stone and concrete, with a smooth surface of Portland cement. Its depth is 4 feet 6 inches for two-thirds of its length, the remaining two-thirds shelving up to 3 feet. It contains about 30,000 gallons of water at a temperature of 98° . It is supplied from an adjacent spring, which has a temperature of 210° . This spring yields about 50 gallons per minute, of which 20 gallons per minute are required to maintain the swimming bath at a temperature of 98° . The water is of the alkaline-silicious type, containing chlorides and silicates, like the Rachel Spring, but a more abundant supply of sulphur gases, and consequently a larger deposit of sulphur. At its source the water is clear and colourless, but when cooled down to 98° it assumes a beautiful opalescent blue tint, resembling nothing so much as the blue flame of burning sulphur. This is due to silica and sulphur in a form so fine and impalpable as to remain in constant suspension. This bath was completed in 1885, and opened by Mr. George Augustus Sala. During the excavation necessary for its formation the workmen struck upon a remarkable sulphur cavern, its roof and sides thickly coated with brilliant acicular crystals of sulphur, and at its base a hot spring yielding steam so strongly impregnated with sulphur gases as to be quite irrespirable. This we have conducted to the surface, and employ as a sulphur vapour bath, diluting it, as occasion requires, with steam of a milder character. In this building we have our electrical room, supplied with Faradic and constant-current batteries, and a galvanic bath. After a long struggle electricity appears to have shaken itself free from the shackles of empiricism, and taken a permanent place in the arcana of legitimate medicine. No hospital at the present day is without its electrical apparatus, yet few hospital men and still fewer busy general practitioners have time for the study it necessitates. It appears destined to become a specialty; and certainly there can be no wider field for its exercise than a sanatorium like that of Rotorua, where neurotic, rheumatic, and paralytic patients congregate, and where constant bathing modifies so favourably the resistance of the skin.

It would make this paper inconveniently long to particularise the numerous springs that exist in neighbourhood of those I have described, which may be regarded as types of the whole of them. We have acidic waters both stronger and weaker than the "Priest," and alkaline waters stronger and weaker than the "Rachel." If we agree as to their physiological action we shall agree also that small chemical differences have no therapeutic importance. It is convenient enough, however, to be able to select a bath either of the acidic or alkaline type, the strength of which shall be best suited to the particular case we have to treat.

The selection of cases suitable for treatment at Rotorua is perhaps the most important part of my subject. I am aware that a strong tendency exists both with physician and patient to try anything as a *dernier ressort*. It is a serious matter, however, to put a patient to the trouble and expense and possibly the pain of making a long and weary journey, to rob him of the comforts of home and the society of his friends, without at least some reasonable hope that his labour will not be in vain. And yet this is constantly being done. Some three years ago when I first took up my present position as Superintendent of the Sanatorium at Rotorua I found that numbers of patients were being sent to the district who ought never to have left their homes. Advanced phthisis, chronic Bright's disease, spinal caries, and Psoas abscess were a few of the ailments supposed to be curable by hot water. This state of things, fortunately, has been remedied, to a certain extent, by a pamphlet I wrote at the request of the Government, giving the medical men of New Zealand a few hints on the selection of cases suitable for treatment at the springs.

The two most important questions to be answered before deciding to send a case to Rotorua are—(1) Has the patient sufficient strength to bear the journey? and, (2) Is the case one likely to benefit by the treatment? With regard to the first question it must be remembered that the five hours' coaching between the railway terminus at Oxford and Rotorua is rather a trying ordeal for an invalid, and will continue to be so until the railway now in course of construction is complete. A case otherwise suitable, however, need not be kept away because the journey may occasion considerable fatigue, or even increase of pain, provided there be sufficient vitality to render such inconvenience a mere matter of temporary concern. Nor need the partial or even total loss of the patient's locomotive power prevent his coming. We have many instances on record of patients who on arrival required the aid of crutches or to be actually carried to the bath, and yet went away enjoying the full use of their limbs. In considering the second

question I need scarcely remind you that where profound organic structural change exists very little benefit can be expected, so that considerable discrimination must be exercised in selecting cases of paralysis for treatment. Hot water has no regenerating power that I am aware of where nerve elements are extensively destroyed. The same may be said of osteo-arthritis or chronic rheumatic arthritis, with structural change and great deformity of the joints. Such cases may improve in general health, gain weight, and lose pain, but there the improvement ends. Our treatment is contra-indicated in phtthisis as long as active destructive changes are going on. Certain chronic poitrinaires, however, pay us periodical visits with advantage. There is a form of incomplete paraplegia very common amongst old miners, of which there must be numerous examples in the Australian colonies. The patient gets about a little with the help of a stick; his walk is shaky and tottering; his general health usually good. Often the mind is somewhat crippled—a mild form of dementia. I had one patient of this kind who enjoyed catching flies in the window and eating them; another who thought it necessary to put up his umbrella when he passed under a lighted lamp indoors. The bowels are generally torpid; there is often dribbling of urine, or at best very feeble control of the sphincter; the muscles are not atrophied, and respond normally to both the galvanic and Faradic current. I consider such cases incurable. Hot baths are certainly useless. Their mental condition, however, is capable of great improvement by proper discipline and diet, and the bowels and bladder may be kept in a state of perfect comfort by galvanism intelligently employed. As they may enjoy this amount of benefit in any hospital, it is useless to send them to Rotorua. Cases of paraplegia, in which the muscles are extensively atrophied, and there is absolutely no response to either galvanism or Faradism, are usually hopeless. I have just had a three months' struggle with such a case in a youth of 21, without conferring the slightest benefit. In hemiplegia, on the other hand, presumably from cerebral embolism, we have had some excellent results. The other day a man about 40 years of age, in a state of *delirium tremens*, attempted to commit suicide with a pair of scissors. He gave himself four stabs with the pointed blade in the left side of the chest. One wound just touched the lung, and there was some extravasation of air into the cellular tissue. In ten days the wounds had healed, and I was about to discharge him, when he was suddenly seized with paralysis. He never lost consciousness, but was unable to articulate, and lost all motor power on the left side. I did not think it wise to commence electrical treatment or hot bathing for the first three weeks. At the end of that time the

muscles of the arm and leg were flabby and wasted, and hot sulphur baths, with Faradism, were commenced. The muscles regained their normal condition in a marvellously short time; in a fortnight he was able to walk, and at the end of two months could speak quite intelligibly, and use both hand and arm very well.

Primary functional paralysis, in which there is reason to believe that the nervous centres have undergone no organic change—such paralysees, for example, as may be induced by depressing morbid influences, as malaria, influenza, sexual excesses, mental or bodily fatigue, rheumatism, or hysteria are likely to benefit by treatment at Rotorua. A lady aged 36, the wife of a medical man, after a long attack of malarial fever, found herself completely paraplegic. After a time she was able to move on crutches, but had a tendency to fall backwards. Her condition improved up to a certain point, when she remained stationary for some months. Fearing she might be crippled for life, she determined to try the thermal springs of Rotorua, and I received her into my house as a private patient. I found her able to swing herself along on crutches, bearing her weight on the left leg, the right being perfectly powerless. Singularly enough, she could walk on her knees, which seemed to point to the fact that the lesion then existing must be below the spinal origin of the nerves supplying the psoas and iliacus muscles; this, together with the fact that she had tried the Faradic current at home, and found it injurious, narrowed down the field for electrical treatment very considerably. I chose two large oval electrodes five inches by three; the anode was placed on the right sacro-iliac synchondrosis, and the cathode on the calf of the right leg, and a continuous current from ten cells allowed to flow for fifteen minutes daily. In addition to this she had two hot sulphur baths every day. In three weeks she was perfectly well. You will find a detailed account of the case in a recent number of the Sydney *Medical Journal*.

Rheumatism and skin diseases form fully 75 per cent. of the cases we are called upon to treat, and these usually in a very chronic form. In rheumatism and rheumatic gout we have much success, especially where arthritic degeneration is not too pronounced.

Hot acidic sulphur baths at a temperature not exceeding 104°, or sulphur vapour up to 115°, taken twice daily, for a carefully regulated time, according to individual tolerance, which we find to vary greatly, forms our routine treatment. These waters redden the skin, and cause some tingling sensation for an hour or two. Should the bath be too prolonged—say over half an hour—some cutaneous anæsthesia is produced, which is neither desirable nor agreeable. Occasionally some irritation of the skin occurs, which is readily

allayed by a few warm alkaline showers or douches. In those numerous and well-known cases of chronic hip rheumatism, initiated frequently by injury, we find nothing so efficacious as the hot douche. The beneficial result is due not so much to the quality of the water employed, as to its mechanical action, and fortunately our arrangements are so complete that we are able to vary the temperature and percussive power of the douche at will. We are able to quote several cases of cure even where a considerable amount of fibrous ankylosis has existed. If the rheumatic patient progresses favourably under the bath treatment alone, neither medicines nor electricity are employed, but if after a few weeks his progress is not satisfactory, we find Galvano-Faradism a valuable adjunct. Usually 30 cells are put into circuit with a Faradic machine, and the double current applied in the labile manner to the parts affected for 15 minutes daily. We find this answer better than either current alone. In cases of muscular atrophy, Faradism is had recourse to from the commencement. Two typical cases of cure, one of uncomplicated and the other of complicated rheumatism, will be sufficient to quote.

Dr. MacGregor, the Government Inspector of Hospitals for New Zealand quotes the following case in connection with our Sanatorium:—"A. B., a young man, became affected with rheumatism while serving as a common sailor on the coast, and was reduced to helplessness. He had spent his all without gaining relief. When he had got half way to Rotorua he found himself at a road-side hotel unable to go further, but a good Samaritan coming along conveyed him in his own carriage to Rotorua, and confided him to the care of Dr. Ginders. In less than a month he was discharged cured." I think it only due to the "Good Samaritan" to state that his name was Sir Robert Stout, Premier of New Zealand.

The second case is a remarkable one. C. H., aged 49, an innkeeper. Height, 5 ft. 11 in.; greatest weight attained, 12 stones 10 lb.; present weight 10 stones 6 lbs.; always temperate. Family history good; no gout or rheumatism; got his first attack 20 years ago—sub-acute rheumatism of the feet; never had syphilis or gonorrhœa. The attacks recurred every winter, each being more severe than the last. The ankles, knees, elbows, and hands became affected. For the last nine years he has spent six months of each year in bed. On his arrival at Rotorua his appearance was that of a man of 70—his hair white, his complexion pale and anæmic, his back bent, liver sluggish, bowels torpid, appetite bad, with slight enlargement of knees, elbows, and knuckles. He commenced taking two acid sulphur baths daily and during the first month improved wonderfully, when suddenly he got an acute exacerbation of pain and had

to take to his bed, fully impressed that his annual hibernation had commenced. He was relieved, however, after a few days and was able to leave his bed. Very soon a more serious complication set in. His bowels, always sluggish, now obstinately refused to move. All aperients and enemata failed; he became feverish, complained of intense pain in his back, caused I believe by the over loaded transverse colon. The rectum was empty,—half a grain of elaterium proved useless. I apprised his friends of his serious condition, and as a last resource tried Faradism. A rectal electrode was passed about nine inches into the bowels and the abdomen freely sponged with the other pole. The strength of the current was gradually increased, and at length we were rewarded by a copious discharge of hard black scybala. All serious symptoms at once disappeared. A few days later there was a recurrence of the same trouble. On this occasion we tried kneading the abdomen with warm oil, followed by a large enema of common salt. An enormous discharge similar to the last was the result, and we had no further trouble. The old aloes and iron treatment kept him in perfect order. He rapidly gained strength, resumed his bathing, and being three months with us considered himself in better condition than he had been for ten years. Very cold weather having set in I sent him home, in appearance a new man, free from pain, his general health excellent, and with an addition of 7 lbs. to his weight. He returns to us in November next, when I have every reason to believe his cure will be completed.

Perhaps there is no class of diseases in which we meet with more uniform success than those affecting the skin. The solid and gaseous constituents of the waters are no doubt important, but I have more confidence in the influence of change, and all that change implies in its effect on both mind and body combined with the prolonged maceration of the cuticle, and the constant exposure of the skin to air and light, which frequent bathing entails. General eczema, which may have resisted every form of treatment for years, is generally cured in a period varying from six to thirteen weeks if the patient is willing to submit himself to rigorous medical discipline. The same may be said of psoriasis, at least as far as its disappearance for a longer or shorter period is concerned. It is rare indeed to find psoriasis completely eradicated. For ringworm and the impetiginous eczema of children, the water of the Priest's Spring is specific. In sycosis, epilation is necessary, after which our alkaline waters complete the cure. In acne rosacea we employ as a local application a soft primrose-coloured deposit which collects on the margin of certain springs. It consists of sulphur, silica, organic matter, and water,

largely impregnated with sulphuretted hydrogen. It is a smooth soft paste, and is applied at bed time. Two acid sulphur baths daily are included in the treatment. Chloasma is readily cured. The most inveterate of all cutaneous ailments we meet with is prurigo senilis.

Three cases of general eczema have passed through the sanatorium quite recently, and in each a complete cure was effected:—W. M., a man aged 63, had suffered for 12 months; W. R., a man aged 43, had suffered ten months, and from pruritus ani 20 years, the outbreak of eczema having cured the pruritus; C. B., a man aged 61, had suffered for five years. Each case remained with us about four months, and left quite cured.

Neuralgias, as a rule, do remarkably well. Patients suffering from sciatica are a numerous class with us, most of them presenting a very chronic history. When the disease is not distinctly associated with the gouty or rheumatic diathesis, is not of long standing, and has been caused by exposure to cold, it is very quickly cured. A few baths relieve the pain, and there is rarely any stiffness or weakness remaining. Chronic cases are not so easily dealt with; they require great patience and perseverance on the part of both physician and patient. Our routine treatment consists of hot baths, sulphur vapour, the douche, and galvanism. After six or eight weeks it frequently happens that nothing remains to remind the patient of his old enemy beyond some slight weakness or soreness of the limb, and I usually advise him to try a week's sea bathing on his way home. In order to accomplish this he should arrive in Rotorua not earlier than September or later than February.

We have had some good results in the treatment of cervico-brachial neuralgia. Some 12 months ago a lady who had long suffered from neuralgia of the circumflex nerve came to Rotorua for treatment. She carried her arm in a sling and dreaded the slightest movement. In spite of her suffering she had attained the terrific weight of 17 stones. After two weeks' bathing and the application of a very mild galvanic current she was able to use her arm, and in a month was completely cured.

There is a strong tendency on the part of patients not to believe in any form of electrical treatment unless the current is almost strong enough to lift them off their feet. The sooner they are disabused of this idea the better. Every week's experience convinces me more fully that for success in the treatment of neuralgias the galvanic current can scarcely be too weak, and in facial neuralgias, and paralysis especially, the greatest caution is requisite.

To enumerate every ailment in which our thermal springs have proved useful would prolong this paper indefinitely. Suffice it to

say, that in many cases their healing power has been discovered accidentally. Many ladies bathing for rheumatism have found themselves cured of chronic metritis and leucorrhœa, and as a result of such cures have proved fruitful after years of sterility. Congestion of the liver, biliary catarrh with jaundice and hæmorrhoids, have been cured by the acid sulphur waters, which also prove useful as a topical application in ozæna and ulcerated throat. This class of water also tends to reduce plethora and corpulency without prostration, insures healthy action of the skin, and relieves torpor of the bowels.

Possibly doubt may still exist in some minds as to the safety of Rotorua as a place of residence, a doubt in some measure justified by the late volcanic disturbances. I shall be glad to give you my reasons for believing that such fears are groundless. In the North Island of New Zealand there exist two belts of volcanic and hydrothermal action. They run from N.W. to S.E., and from N.E. to S.W. respectively, and may be indicated on the map by two lines, one drawn in the first direction from the extinct volcano, Rangitoto, in Auckland harbour, through the Tarawera range to the coast, and the other in the second direction from the active volcano, White Island, in the Bay of Plenty, to the still active volcano, Tongariro, near Lake Taupo. These two lines will be seen to cross each other in Lake Rotomahana, the site of the late gigantic explosion. It is therefore, I think, reasonable to suppose that such immense relief as was then given to the pent up plutonic forces in the very centre of the volcanic area renders the recurrence of similar phenomena in our time highly improbable.

With regard to the hotel and boarding-house accommodation provided for invalids and tourists, we have, at a distance of one mile from the Sanatorium, three hotels and one boarding-house. At the Palace Hotel—which is an admirably conducted house, possessing a valuable thermal spring and comfortable bath-house, the use of which is free to visitors—the charge is ten shillings per day. Lake House, a somewhat larger and more pretentious establishment, has the advantage of two thermal springs and a properly-arranged bath-house, for the use of which a special charge is made. This house commands a fine view of Lake Rotorua, and the charge is twelve shillings per day. The Rotorua Hotel is the pioneer hotel of the district, and a house of more homely character, which has a good local reputation for cleanliness and comfort. The proprietress (Mrs. Morrison) is well known for her kindness and attention to invalids. Her charge is eight shillings per day. All these houses have a lower tariff for visitors who may wish to remain several

weeks. The Carlton Club Boarding-house charges two pounds per week. At present we have only one boarding-house in close proximity to the Government Baths; it is capable of accommodating about 20 visitors. The medical superintendent receives four resident patients in his house. Where privacy and home comfort, combined with constant medical supervision, are desiderata, this provision will be found all that can be desired.

The most direct route for invalids from the Australian colonies is from Sydney to Auckland, and thence by rail to Oxford, continuing the journey by coach to Rotorua. More vigorous individuals, who may wish to see something of the country, may take steamer from Melbourne to the Bluff, land at Wellington, and travel overland to Rotorua, a four days' journey, and most enjoyable in summer.

Patients should be recommended to bring plain, warm clothing, and substantial boots and shoes. Jewellery and valuable watches had better be left at home, as they are not improved by the vapours that hang about the Baths.

CREMATION.

[By the HON. J. M. CREED, M.R.C.S., M.L.C., Sydney.]

I shall endeavour to deal with cremation as a question concerning the whole of Australasia, and the facts which I shall instance will, I think, be of such a character as to induce some thought in all persons feeling interest in the sanitary protection of the population of these colonies, as to whether the time has not arrived to make some change in the present method of disposing of the dead. Though reading this paper in the charming city of Adelaide, my residence has been in Sydney, a distance from it of nearly a thousand miles, and therefore I am not acquainted with local circumstances enabling me to quote local examples of the evils of burial, which I have no doubt are within the knowledge of many gentlemen present who are inhabitants of South Australia.

The question, to be studied with effect, must be viewed from its three stand-points, viz., the religious, the sanitary, and the sentimental. With regard to the religious objection, it is true that Christians, with few exceptions, have hitherto buried their dead, but this probably came about from the fact that the early missionaries of the faith were Jews, a people who always buried, possibly aided amongst converts from other races by the fact that at that period

cremation was the means very generally employed by the pagans, a consequent desire arising to make a marked difference in the new faith. I myself think, though I have no authority to quote for saying so, that another reason for the Christians of early times choosing burial in preference to cremation may have arisen from the fact that they were unable to carry out their religious rites in public, and as cremation could not have been completed in secret, they were thus compelled to bury. Many worthy persons object to the burning of the dead from a dread that it might tend to weaken belief in the doctrine of the resurrection; though it needs but little thought to realize that the beneficent Being, the Author and Ruler of the universe, must be as able to re-create the body whether it has been resolved into its original elements by the ordinary process of decay or by the quicker and more cleanly method of burning. If we may exercise our reason in matters of religion I think the doubts of those worthy persons who fear that their chances of resurrection would be endangered by the destruction of their bodies by fire are most aptly met by the remarks of the benevolent and truly religious Earl of Shaftesbury. He, when appealed to on the subject by an ardent opponent of cremation, who advanced this argument against it, said:—"But, my dear sir, what would, in such a case, become of the blessed martyrs?" He again made use of the same argument when writing to excuse his absence through illness from a meeting held in London on April 23rd, 1885, at which he had promised to take the chair, when an address was delivered by Sir Spencer Wells, Bart., on cremation.

The sanitary standpoint is of much greater importance, and though, no doubt, of less immediate urgency in a new country such as this, which does not yet possess a dense population, than in Europe; yet, it is very desirable that the question should be taken into consideration at once, so that we may in a measure prevent the evils which always follow ordinary burial in a greater or less degree, instead of attempting to remedy them when they have been created.

In a memorandum issued by the Local Government Board in England as to what conditions it is requisite should be observed in the establishment of a cemetery, to prevent it from becoming a source of nuisance and danger to the living; and to avoid contamination of air and drinking water, the following rules at least are requisite:—It is necessary "that the number of decomposing bodies on a given portion of ground should not be so great that the gaseous products cannot be oxidised into harmless substances in the interstices of the soil or be taken up by vegetation. That a sufficient depth of earth intervene between the corpses and the surface. That the soil be of

a suitable nature, and properly drained, the drainage water being innocuously disposed of. The place of burial should be in an open situation, and at a sufficient distance from dwellings, in order that any effluvia arising from it may be diluted by diffusion, or dispersed by the winds, so as not to find their way in an injurious state of concentration to places where they will be liable to be inhaled. It is desirable that the site of the cemetery should be in a neighbourhood in which building is not likely to take place, and also that, so far as practicable, a belt of ground should be reserved between the graves and the nearest land on which a house may be built, in order to obviate to some extent the risk of contamination of ground air and subsoil with decomposing matters. Each corpse, also, should be surrounded and covered by a mass of earth sufficient to deodorise and destroy the putrid emanations proceeding from it; and the total amount of space should be so great that it would not be necessary to reopen any grave until the body previously interred therein should be completely decomposed." If all the foregoing conditions are faithfully observed, there is no doubt that the burial of the dead would be innocuous to the living; but, I would ask, where can a single example of so perfectly situated and managed a cemetery be found? And even supposing the natural conditions are all present, without perfect and faithful management these advantages would be much lessened in value.

The advantages of cremation are best shown by producing evidence of the dangers which have arisen from the usual methods of disposing of the dead. I will therefore give some few examples which prove the magnitude of the evils arising from the present system of burial. The more appalling of these of necessity come from older countries, with a denser population than we have in these colonies, but there are others even in these young communities which go to show that we shall not be over hasty when we desire to commence a change, and by example so educate the masses that eventually cremation will be as general and as much desired by them as burial is at present. Sir Henry Thompson, the celebrated surgeon, one of the foremost thinkers of the age, under whom I am proud to say I was a student, who advocated cremation in an article in the *Contemporary Review* for January, 1874, declared that by selecting a portion of ground distant some five or ten miles from any very populous neighbourhood, and by sending our dead to be buried there, we were "laying by poison it is certain for our children's children, who will find our remains polluting their water sources when that more distant plot is covered, as it will be, more or less closely by human dwellings." How true this is, even in a

very much exaggerated degree, is shown by the experience which all of us have as to cemeteries. The graveyard which formerly occupied the site of the present Sydney Town Hall and its neighbourhood, when the colony was founded less than a hundred years ago, was doubtless considered outside the possible limit of the future town for all ages: yet see what has happened—its site is the centre of a vast city, no trace of it remains above ground, and those relics of mortality, placed there by grief-stricken friends, which have not been disturbed by the exigencies of the city improvements, remain a few feet below the surface, rumpled over continuously by the busy wheels of traffic without a thought or care being bestowed on their memory. The fate of those vestiges of bygone men and women which have been unearthed in the various excavations since made is even more distressing to men of sentiment. They have been carted away and deposited heaven knows where. The Devonshire-street cemetery in that city is another instance. It is now surrounded by a dense population, and will sooner or later have to give way to public necessity, whilst the Petersham cemetery, in which many people fondly hoped to rest alongside their loved ones passed away, has become so surrounded by inhabitants as to render prosecution for the infringement of the municipal by-law in regard to burial a certainty; and several prominent men have been fined on this account.

Stronger examples even than these are those mentioned by Dr. Ashburton Thompson, Chief Inspector to the New South Wales Health Board, in his admirable report on the outbreak of typhoid fever in the municipal district of Leichhardt, near Sydney. In speaking of the contamination of a well which formed the water supply to a dairy there, he says:—"Disgusting as such water is, however, sewage is not the only organic matter it contains. On both ridges are cemeteries, that to the west being the Balmain cemetery, which has been established about 16 years, and which now holds about 9,000 bodies; that on the east being the Balmain Roman Catholic cemetery, established about 12 years, and holding about 1,000 bodies. The soil was supposed to be impermeable until about November last, when the Corporation cut Norton-street down three feet. A shallow section of the lowest part of the cemetery was thus made, and I am told by many people that so fœtid a soakage flowed from the face to the street as rendered the latter almost impassable for nearly six weeks. . . . A clay soil delays putrefaction, but it happens in time, and as is thus proved, when the coffins begin to leak, the putrilage is no longer confined to the grave, but enters the subsoil waters; with this it flows under Norton-street, and down

the slope to Hellsarmel Creek, 240 yards away. There it meets a similar drainage from the Roman Catholic cemetery on the opposite ridge, and both together come to light again at last in that unconsecrated cauldron, the dairy well."

The position of these cemeteries was chosen by the authorities, the one only 16, the other but 12 years since, in the full belief that they were well away from the population for ages to come; yet in this short period they are so surrounded by inhabitants that every acre of land is cut up into small building allotments, and already 1,500 people are living in houses built in the immediate neighbourhood of these cemeteries. The Rookwood cemetery, which was supposed when it was first established by the New South Wales Government to have been at so great a distance from town as to be quite outside the population limit for the next century is now not without inhabitants in its immediate neighbourhood, and at the present rate of settlement it will be but a few years before it has a numerously-peopled district adjoining it. In New York and its neighbourhood they are reaping the ills which arise from the cemeteries established in what were supposed to be far-away places. Brooklyn furnishes an illustration of the evil, being surrounded by a network of cemeteries. In one of these alone, called Greenwood, since its establishment 40 years ago—though it has had numerous other cemeteries to compete with—there were up to 1882 211,000 bodies interred. When it was opened it was well outside Brooklyn, which then contained but 30,000 inhabitants. It is now completely intramural, and the city contains over 600,000 people. The offensive exhalations from this cemetery are continually complained of. The *Lancet* of January 11, 1879, when speaking of the necessity of special measures for the disposal of the dead, said:—"The expedient of burial in suburban cemeteries is only temporary. It may last our time, but the next generation will be called upon to solve the sanitary problem in a more permanent way." It has been asked by thinking men in the medical profession—"By what authority can we affirm that life departs from diseased germs by inhumation? How dare we preserve as we do vast depôt of the germs of yellow fever, of Asiatic cholera, and every year accumulate and treasure up the seeds of small pox, scarlet fever, whooping cough, diphtheria, and measles." It is true that as yet we possess a happy immunity from the two first-mentioned sources, but if once introduced, how are we to be sure without the bodies of those who die from them are cremated, that we are not depositing in the ground, seed-beds of these terrible diseases, to be brought into activity at some future time by the ignorant or unthinking use of the pick and shovel. That this is no mere imaginary

possibility, I will show by examples I will give, in which after the lapse of many years disease has broken out as a consequence of infective germs spread by the opening up of earth in which the victims of epidemics had been buried a long time since. In 1828 Professor Bianchi demonstrated how the fearful reappearance of the plague at Modena was caused by excavations in ground where three hundred years previously the victims of the pestilence had been buried. It was remarked by Mr. Cooper that the opening of the plague burial grounds at Eyane, in Derbyshire, occasioned an immediate outbreak of disease. He also describes how the malignity of the cholera, which scourged London in 1854, was enhanced by the excavations made for sewers in the soil where, in 1665, those dying from the plague were buried. Mr. Simon, C.B., the Medical Officer to the Privy Council, had predicted this result, and warned the authorities of the danger of disturbing the spot. Mr. Eassie, in his work on "The Cremation of the Dead," tells us that, in 1843, when the parish church of Minchinhampton was rebuilding, the soil of the burial ground which was superfluous, was disposed in many of the neighbouring gardens; as a result, the town was nearly decimated.

As high scientific authority is seldom called on to discover the origin of local diseases, unless they assume a malignant or epidemic type, it is safe to believe that thousands of cases of illness and death are occasioned by the disinterment of human remains, without the true cause of the maladies being suspected. Independent even of disinterment, the infected corpse while hidden in the grave may be a means of spreading the disease by which it died. The belief has been expressed that Trinity Church-yard was an active cause of the yellow fever in New York in 1822, aggravating the malignity of the epidemic in its vicinity. During the epidemic of this disease in New Orleans in 1853, Dr. E. H. Burton reported that in the Fourth District the mortality from it was four hundred and fifty-two per thousand, more than double that of any other. In this district were three large cemeteries, in which during the previous year more than three thousand bodies had been buried. In other districts the proximity of cemeteries seemed to aggravate the disease.

Dr. Ronch, who is now the learned and much respected Secretary of the Illinois Board of Health, personally observed during the epidemic of cholera in Burlington, Iowa, in 1850, that the period of the city cemetery was free from the disease until about 20 interments had been made there, and then deaths began to occur, always in the direction from the cemetery in which the wind blew. In a report presented to both Houses of Parliament in England, in 1850, Dr. Sutherland testified that he had witnessed several outbreaks of

cholera in the vicinity of graveyards, which left no doubt on his mind as to the connection between the disease and such local influences.

The investigations of the Massachusetts Board of Health showed that diphtheria and typhoid fever were disseminated not only by infectious emanations and excreta from sick rooms, but also from the graves of persons who had died of these complaints.

Dr. Julius LeMoyne, the first to erect a crematorium in America, wrote:—"The inhumation of human bodies dead from infectious diseases results in constantly loading the atmosphere and polluting the waters with not only the germs that arise from simple putrefaction, but also with the specific germs of the diseases from which death results."

Professor Selmi, of Mantua, has discovered in the stratum of air which has remained during a time of calm for a certain period over a cemetery, organisms which considerably vitiate the air, and are dangerous to life. This was proved after several examinations. When the matter in question was injected under the skin of a pigeon a typhus-like ailment was induced, and death ensued on the third day.

Sir Spencer Wells, in his speech at the Conference on sanitary subjects, held in London between June 9th and 14th, 1884, said that he knew of an instance of a clergyman who had taken into his garden a piece of old disused burial ground, and upon this ground being dug up scarlet fever of a malignant type broke out in the clergyman's family, and spread all over the parish. It was afterwards ascertained that in this portion of the ground the bodies of persons who had died of scarlet fever had been buried 30 years before.

The General Board of Health in England in 1849 held special inquiry into the burial grounds of London and other large towns, appointing for the purpose Southwood Smith, Chadwick, and others. The report was signed by Lord Carlisle, Lord Ashley (better known as the philanthropic Earl of Shaftesbury), Edward Chadwick, and T. Southwood Smith, and goes to show that the placing of the dead body in a grave and covering it with a few feet of earth does not prevent the gases generated by decomposition, together with the putrescent matters which they hold in suspension, from permeating the surrounding soil and escaping into the air above and the water beneath. Sir Lyon Playfair says the same, and adds that he has known the gases to spread laterally more than 30 feet to neighbouring sewers. We have examples in these colonies, many being in the neighbourhood of Sydney, of the contamination of the air and water by the existence of graveyards, at the time and subsequent to burials taking place in them. Amongst the best-known examples are probably the Camper-

down cemetery, now closed nearly 20 years, as being considered detrimental to the health of the district and its neighbourhood. The cemetery at Newcastle was closed for burial purposes because it was found that the wells in the lower portions of that town were impregnated by drainage from it, and it was believed to be the cause of much sickness. It is within my personal knowledge that quite recently in Sydney a boy attracted by curiosity stooped into and inhaled the effluvia from a grave re-opened for the disinterment of a body. He immediately became very ill; vomiting, and feeling very faint. He was taken home, and died in a few days. It is impossible to imagine that such a state of things is not productive of disease, or that it is improbable that germs of disease may not be conveyed from the body of a person having died from a specific disease to give that disease to other persons still living.

The researches of that immortal scientist, Louis Le Pasteur, the possession of whom as a citizen is undoubtedly the greatest glory of France in this century, show conclusively that an animal dying of a specific disease may be buried at a depth of six feet below the surface of the earth and yet infect other animals kept in the field in which the interment has taken place. In his experiments as to the etiology of splenic fever, he demonstrates after the burial of animals dying of that disease, that soil taken from the surface of the ground over the graves reproduced splenic fever in all its virulence after intervals of ten, fourteen, and twenty-four months, and he subsequently found that the specific germs still existed in these places after the operations of ploughing, sowing, and reaping. He also demonstrated that the manner in which these germs were brought to the surface from the depth at which the diseased animals had been buried was by the instrumentality of earthworms, which, swallowing earth at the contaminated depth, bring it to the surface in their intestines, where they leave it in the worm casts which they so frequently deposit on the ground. In remarking on this at the Academy of Medicine, in Paris, Pasteur says:—"In these results what outlooks are opened to the mind in regard to the possible influence of earths in the etiology of disease and the possible danger of the earth of cemeteries."

I think that by the foregoing facts and authorities (very few in comparison with what might be quoted) I have demonstrated that the burial of the dead is highly dangerous when it is done in the neighbourhood of population, and that in spite of all the endeavours of the authorities to provide cemeteries so distant from the habitations as to be innocuous, their efforts have often been futile by consequence of the marvellous increase in the inhabitants of these

colonies. If this be the case now, what must be the state of things fifty years hence, when it is estimated that the population of Australia will be between twenty and thirty millions? I think we should be doing less than our duty did we not look forward at least this time in the material interests of our descendants, and at all events attempt to make some change in the direction of the removal of one potent source of ill. How can this best be done? I am of the opinion by the introduction of cremation. This would at once destroy all possibility of danger as arising from the dead body, destroying as it would in a comparatively few minutes the whole of its organic matter, leaving nothing but about two and a half per cent. of mineral matter, pure and slightly in appearance and in fact. By this method in a properly conducted crematorium, the entire process of the resolution of the body to its original elements would be completed in less than an hour, without the possibility of offence to any of the senses of the bystanders, and with the certainty that it would then be harmless to the living for all time. The crematorium most generally approved of is that of Siemens. In this apparatus no fuel comes into contact with the body, which is placed in a chamber which has been raised to a temperature of 2,000 deg. Fahrenheit, by means of heat, air, and gas; this completely consumes all the destructible portions without the escape into the open air of anything but completely odourless and colourless gases. A more recent apparatus is that of Signor Venini, an Italian enquirer, and I am informed by Signor Flocchi, a cousin of the inventor, that it is in more general use than any other. From the description of it with which I have been favoured by the latter gentleman I am inclined to think that it possesses several advantages which would render it a desirable one to choose when we are able to give practical effect to our opinions in Australia. One of these, and not the least, is that it has no visible chimney and that the appearance of its being an industrial establishment is thus removed from the building, and one shock to sensibility is avoided.

It is very rapid and effective in its work, and the draught is arranged in such a way that none of the ashes are carried away by aspiration.

The cost of a complete apparatus of this character, I am informed, is about £800, and the charges made for the cremation of a body at the crematorium, at Woking, near London, is £6. This cost will be much lower when the custom is more general in England. It is frequent in Germany, where during the first year of its establishment at Gotha 52 bodies were cremated; still more common in Italy, for at Milan 150 cremations took place in the same

period at a cost for each of about 24s. The cost is now even less, and with Venini's apparatus it can be done for about 12s., and the cremations are so numerous as, according to my informant (Signor Fiochi) to be seldom less than five a day. He tells me that 4,000 bodies have been cremated in Milan since the process was introduced, about ten years since. It is also an established custom in the United States, where 118 were cremated last year; whilst in Brazil it is compulsory by law in the case of the bodies of all persons who have died from yellow fever. In Spain the Sanitary Council have formulated several propositions relating to cremation, amongst which is the following:—"Cremation should be voluntary, except during times of epidemics and after great battles."

In Denmark, Bishop Mourad, who was Prime Minister during the critical period of the war with Prussia, and who was one of the most prominent leaders of Danish thought, publicly declared himself in favour of a law which would compel the substitution of cremation for burial. General Garibaldi in his will explicitly directed his body should be burned.

I may here say that I have been astonished at the great amount of sympathy and approval I have received from all classes of persons in my endeavour to introduce cremation. Many have thanked me for my action, telling me that they intend to execute memoranda directing their executors to cause their bodies to be cremated.

This has not been confined to men only, for ladies have earnestly expressed their desire for the same thing to be done for them. Nor has it been solely the wish of people in health. I have been voluntarily told by sick persons that they have prayed that they might live so long that when they did die it would be practicable for their bodies to be cremated.

I would earnestly point out that the burning of the dead is not illegal, for it was decided by Mr. Justice Stephen in a case which recently came before him in Wales, in which a Doctor Price was indicted for burning the body of his child in a very rough and ready fashion, that by the law of England he had committed no offence by the mere burning of the body, and that so long as no nuisance was created there was nothing to prevent the use of the process for the disposal of the dead. I am of opinion, however, that it is very advisable that there should be direct legislation, and that cremation should only be carried out under proper regulations, and in suitable apparatus. One of the objections raised to its becoming general is that it might possibly be made use of as a means of concealment of crimes against life; but the evils likely to result from this have been, I think, much exaggerated, and with proper regulations there

would be less risk of undetected crime than there is at present in many of the colonies with the laxity which prevails as to the permission of burial before registration of the death, and without the production of fitting certificates as to the cause of death.

The Lancet, in an editorial article on the Bill to regulate the process of cremation which I introduced into the Parliament of New South Wales, and which has twice passed the Legislative Council of that colony, said that though hitherto it had opposed cremation on this ground, it found that the objection had been so fully met by the proposed Act that it desired no longer to continue its opposition but hoped that a law on similar lines might shortly be placed on the English statutes.

In dealing with this subject custom and sentiment must of necessity be highly important factors in arriving at a result. Debate as to the propriety of cremation is no new thing, and as an exemplification of the strength of the bond with which custom may bind different peoples I do not think I can quote a stronger example than one given by Herodotus in the 38th section of his third book, which is not only of interest as bearing on the subject we are now considering, but one showing what a grim sense of humour was possessed by the ancient monarch who suggested what must have been a horrifying change to the two peoples. The passage is a literal translation from the original Greek, and it is as follows:—"Darius during his reign invited certain Greeks, and asked them on what consideration they would be willing to devour the dead bodies of their parents. They replied nothing in the world would induce them to do it. Afterwards Darius invited certain Indians of a tribe called Callatians, whose custom it was to devour the deceased parents, and asked them in the presence of the same Greeks—who were made acquainted by means of an interpreter with what was being said—for what consideration they would be willing to consume by fire the bodies of their deceased parents. They screamed out, protesting against such a horrible proposal. Such, then, is the effect of custom, and I think Pindar was right when he sang, 'Custom is the lord of all mankind.'"

We have all become so accustomed to accept burial as the inevitable means for the disposal of the bodies of our fondly-loved friends that it is only after careful thought as to details of the two processes that men can be expected to accept cremation, not only as the best from a sanitary standpoint, but also as the preferable means for preserving that sanctity and refined sentiment with which it is the desire of us all to surround the remains of our loved ones. If we calmly think of the two processes, scientifically the same—for they

are each a process of oxidization—the one lingering and slow, extending over a series of years, the stages of decomposition rendering the body a mass of fetid corruption; a source of danger for those left behind, and a loathsome object to the survivors, who, however devotedly attached, could not but if they saw it a few days after interment view the once loved object with loathing and disgust: the other a rapid, cleanly, decent method, which in a few short minutes reduces the corruptible shell of humanity to a small quantity of ashes, so pure, so free from odour or infection, that though the death may have occurred as a consequence of the most loathsome disease, yet they can be immediately received as a sacred relic and stored in some consecrated spot.

I cannot imagine any person who has thought out the minute details—which it does not require any very vivid imagination to make mentally present—hesitating as to which method to choose for the disposal of the body of anyone dear to him. This process amongst ancient nations was almost universal, and it was especially the case during the most refined and cultured period of Greece and Rome. Human affection has been, and is, much the same during all periods of the world's history. Amongst the ancients instances of devoted affection are recorded which are still the admiration of the world, and will continue to be so as long as history lasts. These recorded cases must form but an infinitesimal proportion of the instances of loving devotion which happened daily; but the fact that they were recorded shows how worthy devoted love was felt to be by the contemporaries of the actors. If this were the case at that time, and as cremation was then considered the most suitable and sacred method for the disposal of the bodies of loved friends, how clear a proof is it to us that it but requires the educating effect of example to remove the prejudices now existing in the minds of some persons against it, and to ensure its being in a short number of years the chosen means almost universally adopted by the free will of the people.

I think the object of the advocates of cremation will be best carried out by the establishment of societies for the purpose in all the colonies. The duty of such societies would be to detect and bring before the public any instances of danger to health which had been created by the burial of bodies in unsuitable cemeteries, to disseminate literature giving information on the subject amongst the people, to provide in due time fitting apparatus for carrying out the process, to advocate the passing of laws to ensure its being done without shock to the sensibilities of those persons whose prejudices prevent their being favourable to it, and to provide regulations

which would prevent it in some rare instances being made a means for the concealment of crime. In this way public thought would be so educated by example that in a very few years cremation would become as general and as much desired by the majority as burial. A danger to health would be removed, and I think you will agree with me in believing that refined sentiment would be better conserved than it is at present.

THE SEWAGE FARM, ADELAIDE.

[By H. T. WHITTELL, M.D., Chairman in Section of State Medicine.]

The Sewage Farm is situated about five miles N.E. of the Adelaide Post Office and about three and a half miles from the western boundary of the city. It receives the drainage from water-closets and the liquid filth from the houses in North and South Adelaide and parts of the corporate towns of Hindmarsh, Thebarton, St. Peters, and Kensington and Norwood. It covers an area of about 470 acres, of which more than 250 acres are under cultivation. The estimated number of inhabitants in the towns drained by the farm is 68,000, but at present only a small part of Kensington and Norwood has been connected. Taking the Adelaide Post Office as a starting point, the fall to the boundary of the farm is 113 feet, and to the lowest part of it 136 feet. The sewage is carried off by gravitation, and it is calculated that soil will pass from the centre of the city to the boundary of the farm in from one to two hours. The drainage from the houses in Adelaide is received into sewers carried below the streets and emptying into a main sewer, which for the greater part of its length is composed of cement concrete, and varies in size from 3ft. 6in. by 2ft. 4in. to 5ft. by 3ft. 4in. Before reaching the farm this sewer is met by one which traverses Bowden and receives the drainage from Bowden, Thebarton, and Hindmarsh. At the point of juncture the section is changed into a trough-shaped sewer, 5ft. wide and 3ft. 9in. deep, which is designed to carry about 23,000 galls. per minute. The number of connections with the sewers at present approaches 9,900. All the houses are protected from sewer gas by properly constructed traps. The ventilation of the street and main sewers is effected partly by manholes and grids opening at intervals into the centre of the streets. It was found on trial that the original design for ventilators was not effective,

and the smell from the ventilators in some parts of the city caused loud complaint. The evil was remedied by closing some of the street ventilators and carrying up long ventilating pipes by the sides of houses in the course of the sewers. Since this alteration no complaints have been received.

On reaching the farm the sewage is strained first by iron gratings, which keep back the larger substances, and afterwards by being passed through an immense revolving wheel with meshes at its circumference keeping back all substances above a quarter of an inch in size. The solid portion of the sewage is collected in carts and carried away for immediate use on the farm. The liquid portion, after passing the straining house, is distributed in troughs so arranged that the supply to any part of the farm can be regulated at will. The farm is worked chiefly on the irrigation principle, the liquid being passed on to different parts as required. A small part of the farm is worked in winter on the filtration principle, the filtration beds being underdrained and the effluent water being carried off clear and almost tasteless into the North Arm of St. Vincent's Gulf.

The farm is divided into paddocks for depasturing purposes and for cultivation of Italian rye grass, lucerne, mangolds, sorghum, wheat, barley, vines, and wattles. The live stock on the farm may be set down in round numbers at 300 cows, 20 horses, 300 sheep, and 150 pigs. The receipts over expenditure in working expenses were last year about £900.

The cost of the sewage works has been about £361,000. The interest is paid by rates on the land and houses to which the sewers have been carried. The income is about £20,200, the working expenses are about £5,800, leaving a balance of about £14,000, or say 4 per cent. on the outlay. The cost of connecting houses with the sewers is paid by the owners, but the Government will undertake the work when requested, and allow the cost to be paid by quarterly payments, extending over six years, interest at the rate of 5 per cent. being paid on the balances.

The water supply to the towns where the deep drainage is carried is obtained from the Adelaide waterworks; it is abundant, constant, and unstinted for domestic use. It is the opinion of the Hydraulic Engineer that the refuse water from houses would be sufficient to cleanse the sewers, but it is the practice to occasionally resort to flushing from the water pipes.





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